NEW RIVER GORGE
National River

Water Quality Monitoring Program
April - September 1992

Prepared by Robert James Sullivan

National Park Service
New River Gorge National River
Division of Resource Management
and Visitor Protection
Resource Management Section

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INTRODUCTION

This report presents the data from the 1992 fecal coliform study and is a continuation of the water quality monitoring programs conducted at New River Gorge National River (NERI) since 1980. Any visible trends between fecal coliform bacteria counts, stage level and/or 48 hour precipitation (48prcp.) are discussed and recommendations for 1993 are presented.

NERI is a 53 mile stretch of New River flowing north from below Bluestone Dam, near Hinton, West Virginia, to just north of the U.S. Highway 19 bridge near Fayetteville, West Virginia. The headwaters of New River are located high in the Southern Appalachian Mountains in northwestern North Carolina. From Blowing Rock, North Carolina, New River flows in a northward direction across southwestern Virginia and enters West Virginia 163 miles from the river's source. The river continues flowing northward for 87 miles to Gauley Bridge where it joins Gauley River and forms Kanawha River. Kanawha River flows northwest to Point Pleasant, West Virginia, and joins the Ohio River, which is part of the Mississippi watershed. From New River's headwaters in Blowing Rock, to Nitro, West Virginia, the New/Kanawha Rivers' course follows that of the ancient Teays River, which began forming as the southern Appalachians rose out of an ancient ocean. Mountain uplift and subsequent erosion have exposed many types of rock in the basin; most typical are shales, sandstones and limestones. On its journey to the gorge, New River passes through extensive area of limestone formations and gathers water from other streams that drain these calcareous lands. Consequently, New River is a well-buffered, biologically productive stream (WVDNR, 1987-88).

In 1978, the United States Congress established NERI and placed it under management of the National Park Service (NPS), an agency of the Department of the Interior. Title XI of the National Parks and Recreation act of 1978 (Public Law 95-625) set aside a 62,000 acre corridor along 53 miles of New River "...to conserve and interpret the outstanding natural, scenic, and historic values and objects in and around New River Gorge and preserve as a free-flowing stream an important segment of New River in West Virginia for the benefit and enjoyment of future generations..."

In considering the mandate of NPS and NERI, the NERI staff became interested in the quality of its water resources. In 1980, NERI began a water quality program to build baseline data upon which future monitoring and management activities could be based. NERI, in its early stages, lacked the proper laboratory facilities to meet its goals, so a cooperative agreement was made with the West Virginia Division of Natural Resources (WVDNR). From 1980 to 1984 the WVDNR's Office of Water Resources conducted water quality studies for NERI. Theses studies focused on several parameters commonly related to commercial and domestic pollution. After examining the data, NERI determined that sewage and/or animal wastes (fecal coliform bacteria) were a major cause for concern due to the large number of river recreationists, who come into bodily

contact with New River. In 1985, NERI attempted to begin monitoring for fecal coliform bacteria, the accepted indicator for sewage and animal waste contamination, (Standard Methods 901A) with a Millipore brand Colicount sampler. This is a quick and inexpensive method, but it is not EPA approved. An unpublished report by NERI on the 1985 sampling effort recommended the use of an approved standard method and an approved laboratory for future bacteria monitoring efforts.

Based on the 1986 recommendation, the USDA Appalachian Soil and Water Research Lab cooperated with NERI to use that lab to analyze fecal coliform bacteria samples. The Membrane Filter Technique, (Standard Methods 909C), an EPA approved analytical method, was used with satisfactory results. In 1987, because of staff changes at NERI, it was decided to once again contract with the WVDNR to do fecal coliform bacteria studies on the New River and selected tributaries. The report "New River Gorge National River Fecal Coliform Study, April-September, 1987-1988", was the result of the agreement. After reviewing the results of the study, NERI decided that a less intensive and more extensive effort would suffice to monitor the fecal coliform bacteria levels. So, in 1989, NERI instructed the WVDNR to reduce the number of sample runs per month from 5 to 1. In turn, they were able to add four new tributary sites to the sampling regime at a reduced cost. At the same time the WVDNR also sampled 18 tributaries, some of these formerly included in the 1989 study, for other water quality criteria. In 1990, in an effort to train personnel and begin the establishment of an approved water quality lab, NERI staff took over the fecal coliform bacteria monitoring from WVDNR and again conducted the studies with the use of the USDA lab in Beckley. The WVDNR continued to sample sites for other parameters other than fecal coliform bacteria. Over the winter of 1990/91, after much preparation and dedication, the NERI staff debuted the newly equipped water resources lab.

MATERIALS AND METHODS

1. Fecal Coliform Bacteria

The fecal coliform bacteria study was conducted in south central West Virginia at New River Gorge National River. The National River flows through Fayette, Raleigh, and Summers Counties. All but three of the 19 sample sites are within the National River Boundary. The three outside are 1-M, New River at Hinton Visitor Center, 2-T, Madam's creek in Hinton, and 16-T, Keeney Creek in Winona. The sample sites are listed in Table 1, and Figure 1 shows their relative locations. In Figure 1 and in Table 1 **"M"** denotes mainstem sites while **"T"** indicates tributary sampling sites. The tributary sites were sampled as close to the main current as possible in order to give an adequate assessment of the waste load carried by the tributary. Mainstem sites were sampled at areas of high public contact or as close to the main river current as possible.

Collection from New River at Prince (8-M) involved lowering a stainless steel bucket into the river from the Prince Bridge and taking the sample from the bucket.

The sampling sites were divided into two districts, north and south. The south district included the sites 1-M through 9-T and the north district included the sites 11-T through 19-T. Each district was sampled on a biweekly basis, on alternate weeks. For example, if the south district was sampled on the first and third weeks of a month, the north district was sampled on the second and forth weeks.

The time period of collection coincided with the warm weather recreation season for the river, which is roughly April through September. There are approximately 23 commercial whitewater rafting companies that operate during this period. In addition, New River is used for swimming, fishing, camping and other activities throughout the year. In summer, the weekday pace is somewhat slower than the pace on the weekends. Weekends are often crowed with rafters, kayakers, canoeists, anglers, and swimmers. Occasionally, temporary high seasonal flows in the fall, winter, and spring will attract recreationists, but this use is small compared with the summer season. Since NERI recreational opportunities are largely based around the river, and most involve bodily contact, it was decided that fecal coliform bacteria would be the parameter to study in addition to the four water quality parameters studied at BLUE and GARI. As time progresses other parameters may be added in order to maintain flexibility in this evolving water quality monitoring program.

As in previous years, the fecal coliform bacteria group was chosen as the parameter that best represents sewage and animal waste loads. The group itself does not consist of many pathogenic organisms, but the presence of such bacteria is a <u>good</u> indication of pollution from disease-causing organisms usually associated with sewage and mammalian and avian feces. The method of analysis used is found in <u>Standard Methods for the Examination of Water and Wastewater: 17th Edition</u>, (henceforth referred to as SM).

Sampling bottles were 250ml and 500ml plastic Nalgene bottles. In order to bind any residual chlorine that may have been released into the streams, a dechlorinating agent was added to the sample bottles, as required in SM 906 A.2. The bottles were then sterilized in an autoclave for at least 15 minutes at 127 degrees Celsius and placed in the drying cycle for another 15 minutes.

Water samples were collected, according to SM 906 A.3.e., the NERI staff sampled on a biweekly basis. The sample bottles were then placed in a 24 quart capacity cooler with ice and transported to NERI water resources laboratory. Analyses began within 6 hours, as required by SM 906 B. Once at the laboratory, the samples were analyzed for fecal coliform bacteria based on procedures described in SM 909 C. The filtering apparatus was a Millipore OM 037 glass 47 mm filter holder. Commercially prepared M-FC media and sterile

(Sterilized MSI cellulosic, white grid, 0.45 micron, 47mm., with pad) were used in the filtration. The sample filters were placed in disposable plastic petri dishes and heat sealed in a plastic bag. The bags with sample filters were incubated for 24 (+ or - 2) hours at 44.5 (+ or - 0.2) degrees Celsius. After incubation, the fecal coliform bacteria densities were calculated according to SM 909 C.3 general formula:

$$\text{Fecal coliform bacteria colonies /100ml} = \frac{\text{Coliform colonies counted x 100}}{\text{ml sample filtered}}$$

The West Virginia Water Resources Board, in order to protect recreational use and public water supply, has set a standard of no more than 200 counts of fecal coliform bacteria per 100ml (WVWRB, 1990) expressed as a geometric mean, based on no less than five samples per month. The geometric mean can be calculated by:

$$GM = \sqrt[n]{[(FC1)(FC2)\ldots(FCn)]}$$

or

$$\left[\frac{(\log FC1) + (\log FC2) + \ldots (FCn)}{n}\right]$$

GM = monthly geometric mean

FC1, 2... n = fecal coliform bacteria value for sample number 1,2...n.

n = total number of samples during month

Due to fiscal restraints, only two samples were taken per month. Thus, the results are considered indicators of streams that <u>may</u> have exceeded the above standard. Interpretation of the results of the 1992 NERI study has been based primarily on whether a stream met, or failed to meet, this criterion (NPS, 1990, 1991). When the samples were taken, the date, time, weather were noted, and 7 other parameters were noted (Appendix 1). The other parameters are water temperature, air temperature, pH, and stage level (where applicable), turbidity, (water condition), dissolved oxygen, and conductivity. In the absence of a staff gage, a visual level was recorded (high, normal or low). Water temperature and conductivity were determined with a YSI model 33 conductivity meter. Dissolved oxygen was determined with a YSI model 51B dissolved oxygen meter. An alcohol thermometer was used to determine air temperature. To detect pH, a Fisher portable, temperature compensating pH meter was used. Turbidity was determined with a Hach model 16800 turbidity meter. Turbidity also was subjectively determined by use of a written scale, along with weather of the day, as illustrated in Appendix 2. All equipment was calibrated prior to each sampling run as per instructions provided by the manufacturer. The stage levels for the following sites, T-5, T-6, T-7, T-9, T-13, T-19, were determined by staff gauges installed and maintained by the United States Geological Survey for NERI: Site T-11 was a weighted

cable gauge, and M-12 was a remote gauging station near Thurmond West Virginia. Gauge readings at M-17 were calculated from M-12 by using the following formula:

Thurmond Reading x 4/3(1.33) - 14/3(4.67)

The stage levels for the south district sites were attained from the recorded phone message at the Bluestone Dam. Gauge phone numbers and information are listed in Appendix 3.

2. Metals

Parameters sampled under the baseline water quality monitoring strategy included, total iron (Fe), aluminum (Al), manganese (Mn), and alkalinity, as well as the 7 listed earlier. Additional parameters being considered for future sampling are total dissolved solids (TDS) and hot acidity. Total iron was tested according to procedures in the Handbook for Water and Waste Water Analysis: Digestion and Selected Methods for the Determination of Metals and Minerals (Hach, 1991). All figures for total iron were derived from this method and were followed without deviation. Total iron was the only metal that was digested before measurement. Once digestion was completed (procedure for liquids Hach 1991, pg. 30-33), total iron was measured by following the steps under the total iron section (Hach 1991, pg. 81-82). The sample volume of 20ml was determined by following the chart in the total iron section, pg. 81. Aluminum was tested according to procedures in the Hach DR/3000 Spectrophotometer Manual, (Hach, 1990). Procedure code A.3 for a range of zero to 0.250 mg/L (Eriochrome Cyanine R Method) was followed without deviation. Samples were completed the same day, so they were not preserved with nitric acid. A 0.100 mg/L aluminum standard solution was prepared according to note C in the Hach DR/3000 Manual for the accuracy check, which yielded acceptable results. Manganese was also tested according to the procedures in the Hach DR/3000 Spectrophotometer Manual. Procedure code M.2 (P.A.N. Method) for low range (0 to 0.800 mg/L) was followed without deviation. The accuracy check was performed as indicated in Water Analysis Handbook (Hach, 1989, pg. 365). Alkalinity was tested according to procedures in Digital Titrator Model 16900-01 Manual (Hach, 1988, pg. 34). Sulfuric acid titration cartridges of 0.160 and 1.600 concentration were used. Phenolphthalein alkalinity was zero for all samples, which were titrated to a 4.8 pH end point. The standard additions method was used for an accuracy check on the samples and yielded acceptable results.

Most samples were single grabs from one point at each sampling site, near the mouth of each stream. Each of the streams sampled appeared to be well mixed both vertically and horizontally. Even though single point sampling is quite limited in its ability to clearly characterize entire watersheds, it nonetheless can support some inferences about the upper watersheds as long as additional knowledge of activities within each watershed is available. However, one cannot assume that the water quality at one sampling point adequately represents the quality at all other points.

When samples were taken, data and time were recorded, as well as the 7 parameters discussed earlier. The samples were collected by hand, either by dipping the sample bottles directly into the water, or by drawing samples in a stainless steel bucket and pouring it into the bottles. In either case, all collection equipment used was rinsed with sample water before each sample was taken. Samples were collected in a manner approved by the EPA. Since analyses were begun within 1 to 2 hours after collection, preservation with acid was not necessary. Due to fiscal and personnel constraints, only the first two quarters of testing was completed. Interpretation of this data is, therefore, limited in scope.

RESULTS and DISCUSSION

Water quality was examined on 7 sites on the New River and 11 tributaries. The following section presents the results of these examinations along with a discussion of possible explanations for water quality violations, in relation to the 48 hour precipitation and water level. It must be noted that the use of the term "violation" is relative in this report. In water contact recreation, the standard for fecal coliform bacteria is no more than 200 fecal coliform colonies per 100 milliliters of sample, reported as MFC/100ml which stands for Membrane Filter Count per 100 milliliters of sample. In addition, this part of the standard is only legally valid in the context of at least 5 separate samples per month. If the geometric mean of the 5 samples exceeds 200/100ml, then the sample site is considered to be in violation of the standard. The second part of the standard states that if more than 10% of the samples exceed 400/100ml, then the sample site is also in violation. Since NERI sampled less than 5 times per month, the standard cannot be legally applied to these results. However, for this report, a reading of more than 200/100ml will be used to point out bodies of water that may very well be in violation of the standard.

Figures 2-19 display the MFCs for the 1992 sampling sites. Appendix 4 presents the raw data which correspond to Figures 2-19. Appendix 5 presents a summary of the raw data, arranged by site and date. Appendix 6 contains the raw data from the metals tests, arranged by date. A more complete description of the sampling site locations is found in the Water Quality Site Location Field Guide (Sullivan, 1990).

"River left/right" is a boating term used on New River to describe the location of rivers edge from the viewpoint of a person facing downstream. This report will also use the term to describe sampling locations in the same context.

01-M, New River at Hinton, NERI Visitor Center (Figure 2)

This site is located on river left of New River behind the visitor center, approximately 1 mile downstream of Bluestone Dam. Since there is no tributary entering the river between the Dam and the sample point, this site is fairly representative of the discharge

from the reservoir.

Like last year, this site had only one violation (524/100ml on June 8). As evident in Figure 2, this violation corresponded with an increased runoff upstream, indicated by high turbidity and increased dam flow. Six of the 10 readings were below 32/100ml, closely mirroring the numbers from 1991. Generally speaking, the results suggest acceptable levels of fecal coliform bacteria with just an occasional fluctuation above the standard. Since public access to New River is provided by the NPS at this point, the potential for human exposure to water borne pathogens warrants further monitoring.

02-T, Madam Creek near the mouth (Figure 3)

This sample was taken on stream left immediately downstream of the River Road bridge that crosses Madam's Creek in Hinton. The first sample for this creek was taken in 1989 and was found to have high levels of fecal coliform bacteria. Levels have remained consistently high over time. In 1992, seven of the 10 readings exceeded the standard and 5 were higher than 1700/100ml, with the highest being 13,700/100ml. Although only two samples were taken per month, these numbers strongly suggest that Madam's Creek is in violation of the WVWRB standard.

A negative correlation exist between fecal coliform bacteria and water level/precipitation. In fact, lower fecal coliform counts occurred in the spring, whereas the highest counts occurred as the summer progressed and rainfall decreased. This pattern is a classic example of a continual source of sewage entering the system. Poor, failing or absent sewage treatment systems are contributing a steady amount of sewage whether conditions are dry or wet. During the heaviest rains, the sewage in the creek is actually being diluted so that the fecal coliform bacteria levels are low. As the summer progresses and the weather becomes dryer, the levels increase, since the same amount of sewage is being discharged into the creek. Figure 3 very clearly shows this stair-step pattern.

03-M, New River below Hinton Old Sewage Treatment Plant (Figure 4)

This site is a mainstem site on river right about 30 meters downstream of the effluent of the old Hinton Sewage Treatment Plant. With the "new" treatment plant on-line, an improvement was anticipated at this site and did, in fact, occur.

The highest fecal coliform bacteria count was 476/100ml on 6/8; the next two highest were 135/100ml on 7/21; and 120/100ml on 8/17; all other readings were below 83/100ml. In the past, this site had numerous violations with MFC's reaching as high as 224,000/100ml. Much credit should be given to the people and the officials of Hinton for their work on this once problematic site. There is no longer a need to sample at this site and it will be dropped in 1993. The new treatment plant should be included in future water

quality monitoring effort. This could be done two ways, either by establishing a sampling site just downstream of the effluent, or by requesting the monthly discharge monitoring report from WVDNR. It would be best to look at the monthly reports first if a problem is identified then a sample regime can be put in place.

04-M, New River at Sandstone Falls (Figure 5)

The sample site is located about 7 miles downstream of site 03-M. It is on river left and above the constriction of Sandstone Falls. This site had one concentration exceeding the 400/100ml standard of 512/100ml on 6/8; this high value corresponds with high values at other New River sites on the same date. The condition of the river was high and turbid with only 0.06" of precipitation locally in the previous 48 hour period. This suggests that the dam was releasing voluminous amounts of water that day. The next highest level of fecal coliform bacteria was 83/100ml on 8/17. The eight other samples fell below 35/100ml. These numbers closely mirror figures from a few years ago, and suggest that the site usually has low concentration of fecal coliform bacteria.

In previous years, this site consistently has had at least a few concentrations above the 200/100ml standard (7 in 1987; 4 in 1988; 3 in 1989). No definitive explanation can be given for this supposed improvement in fecal coliform bacteria levels. Past contributors to bacteria levels were suggested to be a fairly large duck population and raw sewage from summer residences.

05-T, Lick Creek at Stream Gage Site (Figure 6)

No violations were recorded for this site, and although three counts were above 150/100ml, the others were 64/100ml and below. The effect of stage level and rain does indicate a relationship with elevated fecal coliform bacteria levels, as evident in Figure 6.

Conductivity readings were lower during high flows (spring) and increased during low flows (summer). This is quite normal for any tributary within the boundaries of NERI. There was nothing unusual about the pH readings, which ranged between 7 and 8. There is no mining activity in this watershed.

06-T, Meadow Creek at Stream Gauge Site (Figure 7)

This site is located downstream of the Meadow Bridge STP. This treatment plant was not considered a problem, based on past data. This site had one reading of >200/100ml, that exceeded the standard on July 21. Previous patterns on this creek were said to have followed a seasonal fluctuation affected by non-point sources of pollution (WVDNR 1987-88). The STP at Meadow Bridge has had some inflow problems and operation deficiencies that occasionally contribute partially treated wastewater to Meadow Creek. Spring flows are usually higher than summer flows, causing a flushing effect of runoff (Figure 7). In 1992 no correlation between flow

and rainfall, is evident. The highest reading, >200/100ml on July 21, came with a flow of 1.10′ and 0.00" 48 hour precipitation. The next sample was 40/100ml on August 3, with a flow of 1.22" and only a trace of precipitation.

07-T, Laurel Creek at Quinnimont (Figure 8)

This site had no readings above the standard. The highest reading was 83/100ml on June 9, and occurred during the third highest flow of the season, 6.75′, and with a precipitation of 0.18". This site continues to exhibit low levels of fecal coliform bacteria. In 1988-89, the stream was not sampled because the 1987 levels were low and there was only one violation recorded in 1990. Although the fecal coliform bacteria levels have been consistently low, sampling will continue in order to closely monitor pH and other mining-related parameters.

08-M, New River at Prince (Figure 9)

New River at Prince had one reading, 388/100ml on June 9, in excess of the standard. The remainder of the readings were below 37/100ml. The violation on June 9, occurred after a 48 hour precipitation of 0.18" and the Hinton stage level at approximately 7.00 feet. This high flow was more than likely responsible for the high fecal coliform bacteria level recorded that day. The remaining data for this midstream site coincide with data collected in previous years.

09-T, Piney Creek at McCreery (Figure 10)

Piney Creek is the largest tributary to New River within the NERI boundary. Both the Beckley and North Beckley STPs have inflow problems causing overloading at the plants and overflows from the lift systems into the watershed. In previous sampling of Piney Creek, fecal coliform bacteria levels have been recorded in the thousands and tens of thousands.

Beckley civil engineers claim that improvements have been made at both STPs, and in fact, data supports this claim. Piney Creek had only 3 counts above the standard. These were 202/100ml on 6/9, 460/100ml on 6/23, and 1200/100ml on 7/6. The next highest reading was 147/100ml on 4/16 and the others were all below 139/100ml. It is obvious the STP facilities in Beckley and North Beckley have made real improvements in the past year and should be commended. The results from 1990 showed some improvement over 1987-1989, and the results from this year are noticeably better than 1991 data. Although the sampling site is located about 9 miles from the treatment plants, enough fecal coliform bacteria survive and could potentially pose a human health risk. Because this site is a public access for middle New River boat and kayak trips, Piney Creek should be continuously monitored in the future.

11-T, Dunloup Creek at Stream Gauge Site (Figure 11)

Included in the drainage of Dunloup Creek are the town of Mount Hope and several other small communities. The White Oak Public Service District (PSD) and the town of Mount Hope have STPs that discharge into the creek. The plant in Mount Hope is often overloaded and frequently discharges only partially treated sewage. During the sampling regime, overflows in collection systems occurred during moderate precipitation events. There is no doubt that leaching from dwellings, with and without sewage systems, contributes fecal coliform bacteria to this creek. Figure 11 seems to support this; in the spring when there is a high water table, i.e., increased precipitation, it flushes out fecal coliform bacteria from failing domestic systems. However these contributions are difficult to pin-point and are often masked by high levels of bacteria added by the two STPs and their collection systems.

This site had 8 out of 11 readings above the standard. The two highest were 1020/100ml on 5/14, and 3000/100ml on 8/28; the next four were above 340/100ml; and the last two were above 220/100ml. These figures closely mirror those in the 1991 report. Looking at the stage level and precipitation, a general trend of high flow and high fecal coliform bacteria is shown in Figure 11. Except for the concentration on 8/28 the highest readings occurred in the spring and early summer, with elevated counts during increased flow, but from spring to fall an overall gradual decrease can be observed.

Conductivity measurements were considered high, sinse no reading was below 200 umhos. Although the iron in the creek was not above the standard, it was measurable. With this and data provided in reports from the WVDNR seems to indicate there is a pollution source, i.e., mining activity in the upper region of the watershed. The pH readings were typically in the 7 to 8 range. Mine drainage entering the creek further up in the watershed is generally diluted and/or buffered prior to reaching the sampling site downstream, so the readings do not exhibit levels typical of acid mine drainage.

On occasion, there was an offensive odor emanating from this creek. Because of the residences, heavy fishing use, and boater use, there is a continuous need to monitor this creek. White Oak PSD is in the process of installing a grit chamber, modifying the aeration system, constructing a clarifier, contact tank, and post-aeration system. Improvements have been made at Mt. Hope STP, there has been increased pressure on individual homeowners by the Health Department to properly install and maintain septic systems. This should improve the fecal coliform bacteria levels on this scenic stream, to what extent should be determined in the near future.

12-M, New River at Thurmond (Figure 12)

This site is located on river right in the middle of the town of Thurmond. Fairly elevated readings were recorded, but none were above the standard. The highest readings tended to occur in the spring; 199/100ml on 4/28; 72/100ml on 5/14; 184/100ml on 6/1; and 180/100ml on 6/17, when New River was at a high flow. This is

common and somewhat expected for sites on the New River. The second highest reading was August 28, 198/100ml, with a 48 hour prcp of 0.55". It appears that this high count reflects a sudden rainstorm that flushed bacteria from surrounding land into tributaries of the New River.

New River at Thurmond displayed seasonal patterns of bacteria contamination that are typical of streams affected by non-point source animal waste. However, point sources, such as STPs of rural communities, can also increase bacteria levels in streams during precipitation events, if they receive wastewater from combined storm water/sewer systems in large quantities. The data indicates that this does occur at this site. For this reason, it is recommended that sampling continue and be moved downstream to determine the effects of point and/or non-point sources of pollution.

13-T, Arbuckle Creek Near The Gauge Site (Figure 13)

During this sampling year, Arbuckle Creek had 6 out of 10 readings above the WVWRB standard. The highest was on May 14 at 2420/100ml; the other 5 above the standard ranged between 273 and 1080/100ml. These results are similar to those of 1991 and would indicate that Arbuckle is still being impacted by sewage wastewater. The Arbuckle Creek watershed has two STPs, Oak Hill STP and Arbuckle Public Service District, in Minden. These two facilities have reported discharging partially treated sewage into Arbuckle Creek during high precipitation events. The Oak Hill facility is often overloaded and several lift stations along the collection system overflow frequently even during dry periods (WVDNR, 1987-88). The data for 1992 would seem to indicate that many of these problems still exist.

14-T, New River at cunard (Figure 14)

This site is located on New River at Cunard boat access and is the first year of sampling. The highest fecal coliform bacteria count was 274/100ml on 4/28, and was the only violation of the 200/100ml standard. Others were 193/100ml on 6/1; and 140/100ml on 6/16, the rest of the data resulted in readings of 65/100ml and below. Data thus far appears to demonstrate the seasonal trends that are common to the other New River sites discussed earlier, i.e., elevated bacteria counts in spring with increased rainfall and higher flows and decreased bacteria as the water subsides. It is difficult to make any other conclusions from this data, since this is the first time that any data has been collected from this site. This is an important access point maintained by the NPS for sportsmen and boaters alike, therefore, monitoring should continue at this site.

15-T, Coal Run Near Cunard (Figure 15)

Coal Run had 6 violations in 1992, compared to 1 in 1991. The highest reading was 785/100ml on 8/28, with a 48 hour prcp of

0.55". The next two highest readings of 640/100ml on 6/1 and 720/100ml on 6/16 each had only an average of 0.11" for 48 hour prcp. No definite relationship can be established between the precipitation and fecal coliform bacteria as a result. The levels of bacteria increased and decreased throughout the year, but the 1992 data does show a overall decrease in the water quality of Coal Run compared to previous years.

Conductivity readings were rather high; at 5 different times readings were has high has 431/umhos, higher than those of Dunloup Creek or Arbuckle Creek. For every sample taken, this site exhibited milky, murky or turbid conditions, even during normal flows and low 48prcp conditions. The high conductivity and turbidity readings indicate that there are continual disturbances in this watershed, perhaps related to mining activity or even the landfill. Sampling will continue at this site so that the range and scope of these problems can be addressed.

16-T, Keeney Creek Below Winnona (Figure 16)

This site exceeded the standard on every sample occasion except one. The lowest reading was 60/100ml on 4/27 and the levels of bacteria increased as the season progressed. The highest was 3000/100ml on 9/8. This trend closely mirrors that of Madam Creek in that a negative correlation can be drawn between fecal coliform bacteria and stage level/precipitation. The lower bacteria counts were in the spring, whereas the highest counts occurred as rainfall decreased, an indication that high rainfall dilutes the waste load early in the season. High levels of bacteria throughout the sample period indicate that a continual source of wastewater is being introduced into the creek, either by failing sewage systems or by straight household discharge. Since much of the creeks watershed is in an isolated forested area, and the sample site is located in the upper reaches of this watershed, it is suspected that the community of Winona is the main contributor.

Although the wastewater associated with fecal coliform bacteria are not voluminous enough to greatly reduce dissolved oxygen, a serious problem still exists with bodily contact for people using this creek. While fecal coliform bacteria are not pathogenic organisms, per se, the group is a good indicator of pollution that might contain disease-causing organisms, usually associated with sewage. For this reason, the monitoring of Keeney Creek will continue to be indefinitely.

17-M, New River at Fayette Station (Figure 17)

The sample is taken just out from the beach above Fayette Station rapid. This area is a popular recreation spot: anglers fish New River and Wolf Creek, picnickers utilize the beach, swimmers take advantage of the deep hole out from the beach, and boaters take-out and put-in to run the rapid.

New River at Fayette Station exceeded the standard just once in

1992, 280/100ml on 4/27. Some of the other highest readings included 105/100ml on 6/2, 121/100ml on 6/16, and 90/100ml on 6/30. The pattern of fecal coliform bacteria readings at this site on the New River generally followed the high levels of bacteria in the spring, then decreased as the summer season progressed and the stage level dropped. Data from 1990, 1991, and 1992 would suggest that the bacteria levels at this site are lower when the stage level is low. Current at low flows appears to carry the water from Wolf Creek into an eddy near the sampling site and, thus, may affect bacteria concentrations. Moving the sample site upstream of this eddy was considered, however, a large number of recreationists currently use the site so it was decided that monitoring should continue at its present location to address possible public health risks.

18-T, Wolf Creek at Fayette Station (Figure 18)

The Wolf Creek head water begins in Lochgelly near an old mine site, then flows by Fayette Square Shopping Center and cross Rt-19 in several places. The creek then drains a large area around Fayetteville, which has fairly large tracts of pastureland. Often during heavy rain events, these pastures can contribute fecal coliform bacteria to the stream, but these contributions are negligible and often masked by voluminous untreated sewage that flows from a overloaded lift station on House Branch of Wolf Creek. As the summer season pushes on and weather becomes drier, the lift station is able to pump sewage over to the STP, which lies in the Marr Branch watershed, where attempts are made to treat it.

During the sampling year, 4 of the 5 violations occurred during May and June, the spring and early summer wet period. The highest reading was 1200/100ml on 6/30, the same day Marr Branch had a bacteria level of 3200/100ml. The final violation occurred on 7/28 with a reading of 750/100ml. This result does not fit the spring and early summer wet period, but the relationship between these two streams is obvious. On July 28, a 48 hour precipitation event of 2.36" was recorded and it is probable that the lift station on House Branch of Wolf Creek was once again overloaded, discharging untreated sewage directly into Wolf Creek.

It has recently been reported that Wolf Creek has been plagued with serious acid mine drainage problems. Drainage coming from the Summerlee mine had overflowed the impoundment and is directly flowing into Wolf Creek. In 1993, this creek will be closely monitored in order to determine the affects of this acid mine drainage.

19-T, Marr Branch below Rivers, Inc. Campground (Figure 19)

Marr Branch lies along part of the road that connects U.S. Rt.19 to Fayette Station, a popular recreation area. The sample site is located about 1000 meters downstream of the confluence of Marr Branch and an unnamed tributary, at Rivers campground. This stream is the most negatively impacted by sewage of all the streams

sampled in NERI, with Madams Creek and Keeney Creek close behind. The main contributor of this wasteload is the Fayetteville STP, which discharges into the unnamed tributary. During some periods, this STP is overwhelmed by a flow estimated to be as much as three times the amount as it was designed to accommodate (WVDNR 1987-88).

Spring runoff helps dilute the wastewater and the amount of inflow helps to dilute the sewage passing through the STP, causing a pattern reversal of the usual in most other NERI sites. Fecal coliform bacteria levels were lower in spring and early summer, then increased throughout mid-to late summer.

Marr Branch exceeded the standard 8 times out of 11; levels were as low as 60/100ml on 4/27, and reached as high as 15,400/100ml on 7/14. Other counts were 9,400/100ml on 8/10, with several in the 2,000/100ml to 3,000/100ml range. On most sample dates, a foul stench emanated from the creek and it exhibited a milky gray or a murky black, sludgy color.

Marr Branch is a fairly swift moving stream and dissolved oxygen (DO) readings should reflect that, but they do not. The bacteria and sewage fungus in the stream consume much of the dissolved oxygen. In the spring, the stage level is higher, the temperature is lower, and some of the sewage is diverted to House Branch on Wolf Creek. Marr Branch can and does hold high levels of dissolved oxygen during that period. But between mid-to late summer dissolved oxygen levels were 4.9 mg/l and lower (Appendix 11). On August 10, the fecal coliform bacteria level was 9,400/100ml and NTU (turbidity) was high, but the stream level was low, indicating suspended solids but probably not soil sediments. Dissolved oxygen was 4.5mg/l, and water temperature 20.2 celsius, so that saturation should have been 8.81mg/l, however, it was roughly half of the reading observed. One dissolved oxygen observation was as low as 2.4mg/l, an obvious violation of the dissolved oxygen standard established by the WVWRB.

Conductivity is another problem for Marr Branch. Sampling is conducted near the headwaters of this stream, so it to be expected that the conductivity would be a little high. As summer progressed, and the stream entered a low flow period, the readings begen to rise from 100/umhos to as high as 500/umhos. This trend resulted from the large amount of wastewater present at this site.

A campground operated by a private rafting company, Rivers Inc, is located at the confluence of the polluted unnamed tributary and Marr Branch. Many visitors, apparently unaware of the health risk, bathe in Marr Branch near the campground and at the it's mouth. Because of the type and volume of use this stream receives, the public should be made aware of the possible health risks involved with using the water at this site.

CONCLUSION

Overall, the water quality monitoring program reveals that the water quality, in relation to animal and human waste, as well as other parameters, remained consistent with past data. Previous data have indicated specific tributaries and mainstem sites that were in violation of WVWRB standards. In 1992, some of these sites have indeed improved, while the quality of others have deteriorated. As mentioned earlier, only two samples were taken per month at each site. The WVWRB standard for reporting violations, requires that five samples be taken each month at each site. Therefore, any comments made in this report about the New River, its tributaries, sewage treatment plants, and communities have not been established statistically; these statements serve to identify possible problems areas and trends that exist at these sites.

This water quality monitoring program revealed the following tributaries are heavily impacted by overloaded STPs and faulty collection systems: All though Piney Creek has demonstrated a high level of bacteria in the past, this year the creek exceeded the standard in only 3 of 11 samples taken, compared with 50% "violations" in 1991. Some of the improvement to this stream is credited to modifications made to the Beckley and North Beckley STPs. Dunloup exceeded the standard 8 times out of 11, where leaching from dwellings, with and without sewage systems, contributes bacteria to this creek. These levels are small compared to the high levels of fecal coliform bacteria being added by Mount Hope STP and White Oak PSD. Arbuckle Creek, which is adversely affected by Oak Hill STP and Arbuckle PSD, exceeded the standard in 6 of 10 samples taken. Marr Branch, the stream that is most affected by fecal coliform bacteria, exceeded the standard 8 out of 11 times. By no fault of the operators, the Fayetteville STP often is overloaded, sometimes by as much as 3 times the volume of the plant capacity (WVDNR 1987-88). Wolf Creek had 5 out of 11 samples that were above the standard, primarily due to the overloaded lift station for the Fayetteville STP.

Of these streams, Wolf Creek, Dunloup Creek and Marr Branch present the greatest public health risks. The mouths of both Wolf and Dunloup Creeks are used by recreationists and as access points for the New River. Marr Branch presents a risk as well, since it flows through the middle of the Rivers, Inc., rafting company and campground. The public needs to be made aware of the possible health risks involved with exposure to high fecal coliform bacteria levels. Wolf Creek could be considered a lesser or greater threat, depending on the time of year. During the spring, heavy rain events cause the lift station on House Branch to fail, contributing large amounts of untreated wastewater to Wolf Creek. This is reflected at the mouth by high levels of fecal coliform bacteria. From mid to late summer, the lift station is able to pump the wastewater over to the Marr Branch watershed, somewhat reducing health risks. Although Arbuckle Creek flows mostly through uninhabited forest, it should be considered a lesser threat to

public health. The Mary Draper Ingles Trail follows along Arbuckle Creek and access to the creek along the trail presents many possibilities of exposure to hikers. As park visitation increases, so will the health risk factor.

Madam's and Keeney Creeks do not have STPs in their watersheds, yet these two creeks have some of the highest fecal coliform bacteria levels found in NERI. It is likely that these streams are being adversely affected more by the communities in their respective watersheds than by natural contributions. Madam's Creek is affected by poor, failing or even absent domestic waste systems along its banks, while Keeney Creek is probably affected by the lack of residential sewage treatment in the town of Winona.

The remaining tributaries seem to be in good condition, with relatively low fecal coliform bacteria levels: Lick Creek (05-T); Meadow Creek (06-T); Laurel Creek (07-T); Piney Creek (09-T); and Coal Run (15-T). Lick Creek and Laurel Creek had zero violations, Meadow Creek had one, and Coal Run had six. Keeping in mind the limitation of this data, these creeks seem to be in fair condition.

Regarding the mainstem sites, all had just one violation of the standard, except New River at Thurmond, which had none. Overall, the data seems to indicate that the water quality of New River during the recreation season is relatively good. Risks to water recreationists, would occur in the spring during normal to high flows, since the fecal coliform bacteria levels were in greater concentration during this period. Other mainstem locations that could present health risks due to wastewater pollution, are near the mouth of some polluted tributaries: New River just below Marr Branch, Madams Creek, Keeney Creek, Dunloup Creek and Arbuckle Creek, base on data, all carry relatively high concentrations of fecal coliform bacteria into the New River.

RECOMMENDATIONS

The number and locations of the sample sites should remain unchanged for 1993. New River below the old STP in Hinton should be dropped and another site added below Sandstone Falls. NERI has built a bridge near the main falls, which provides the opportunity to obtain a well mixed sample that would be fairly representative of the New River mainstem.

The NPS should take the lead in placing warning signs along banks of the more heavily polluted tributaries to caution park visitors regarding high levels of fecal coliform bacteria present in those creeks. In addition, warning signs should also be posted at key New River access points, where fecal coliform bacteria have been found at high levels routinely.

LITERATURE CITED

Division of Water Resources Monitoring Branch, West Virginia Department of Natural Resources, 1989. New River Gorge National River: Fecal Coliform Study, April - September, 1987-1988. Charleston, West Virginia.

Greenberg, Arnold E., R.R. Trussell, L.S. Clesceri. 1985. Standard Methods For the Examination of Water and Wastewater. 17th edition. American Public Health Association. Washington D.C.

Hebner, Scott W. 1991. New River Gorge National River: Fecal Coliform Study, April - September, 1990. New River Gorge National River, Division of Resource Management and Visitor Protection, Resource Management Section. Glen Jean, West Virginia.

Schmitt, David M. 1990. New River Gorge National River: Fecal coliform Study, April - September, 1990. New River Gorge National River, Division of Resource Management and Visitor Protection, Resource Management Section. Glen Jean, West Virginia.

West Virginia Water Resources Board. Title 46, Emergency Legislative Rules. Requirements Governing Water Quality Standards, 1990.

Wood, Douglas M. 1990. New River Gorge National Water Quality Study 1989. West Virginia Division of Natural Resources Water Resources Section. Charleston, West Virginia.

Wood, Douglas M. 1990. New River Gorge National River Water Studies Summary 1980 -1986. West Virginia Division of Natural Resources Water Resources Section. Charleston, West Virginia.

TABLE 1

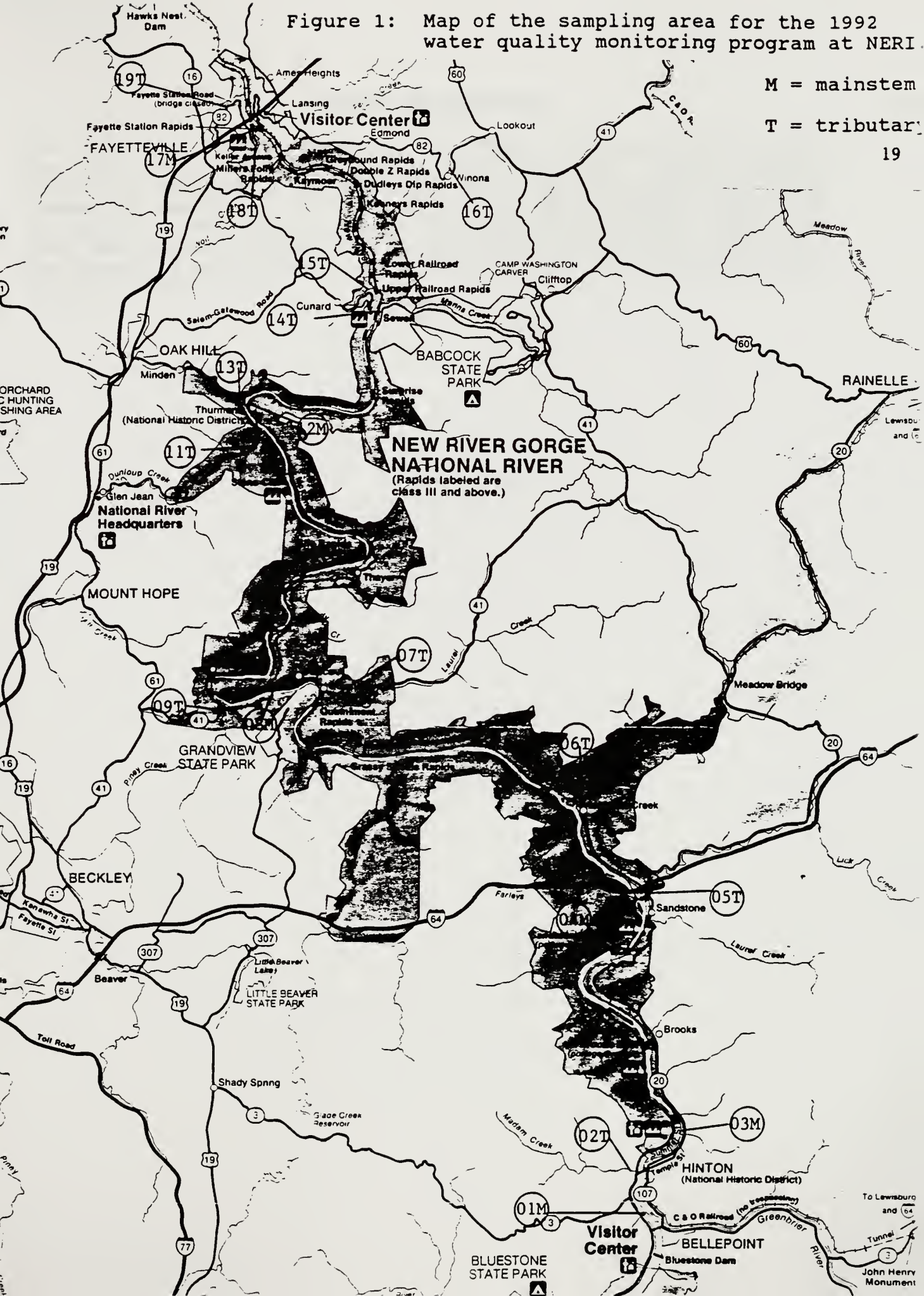
New River Gorge National River
Water Quality Monitoring Site Locations

MAP CODE (Figure 1.)	SAMPLE LOCATION
01-M	New River (Hinton) at New River Gorge National River Visitor Center (river left)
02-T	Madam Creek near mouth
03-M	New River below old Hinton sewage treatment plant (river right)
04-M	New River above Sandstone Falls (river left)
05-T	Lick Creek (stream gage site)
06-T	Meadow Creek (stream gage site)
07-T	Laurel Creek at Quinnimont (stream gage site)
08-M	New River at Prince Bridge
09-T	Piney Creek at McCreery (stream gage site)
11-T	Dunloup Creek (stream gage site)
12-M	New River at Thurmond (river right, below Dunloup Creek)
13-T	Arbuckle Creek across from Thurmond (stream gage site)
14-M	New River at Cunard (river left)
15-T	Coal Run near mouth
16-T	Keeney Creek at Winona
17-M	New River at Fayette Station (river left, swimming area)
18-T	Wolf Creek near mouth
19-T	Marr Branch below Rivers, Inc. campground

Figure 1: Map of the sampling area for the 1992 water quality monitoring program at NERI.

M = mainstem

T = tributary



FIGURES EXPLANATION

The following figures represent the fecal coliform bacteria data for the 1992 New River Gorge National River water quality monitoring program. It should be noted that each chart should be looked at separately, as the vertical **"y"** axis changes from chart to chart, so the figures cannot be compared directly. Also note that the stream level unit is in tenths of feet. The rainfall is the amount of precipitation that fell within a 48 hour prior to the sampling date.

Figure 2. Fecal Coliform Data for New River at Hinton Visitor Center

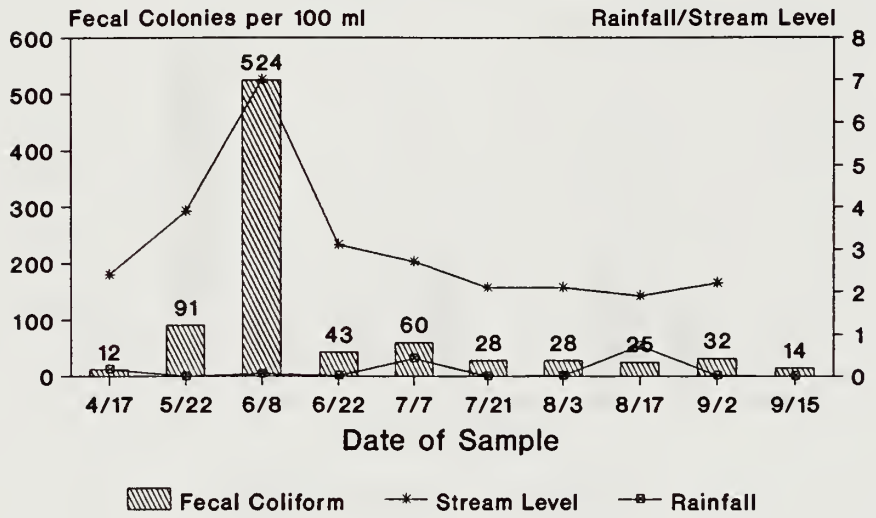


Figure 3. Fecal Coliform Data for Madam Creek

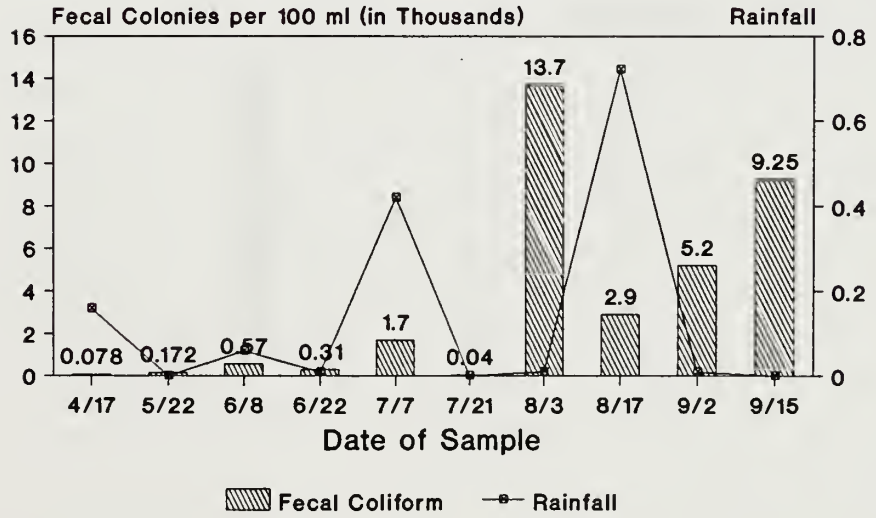


Figure 4. Fecal Coliform Data for New River at Hinton STP

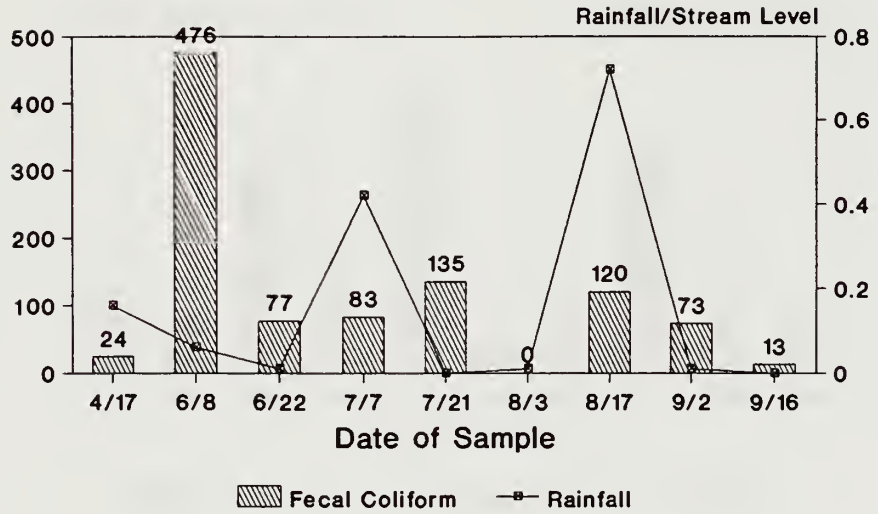


Figure 5. Fecal Coliform Data for New River at Sandstone Falls

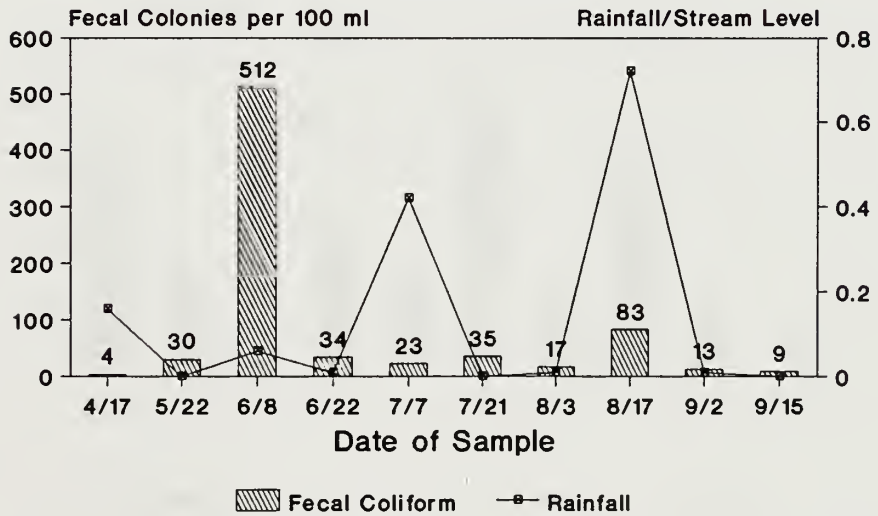


Figure 6. Fecal Coliform Data for Lick Creek

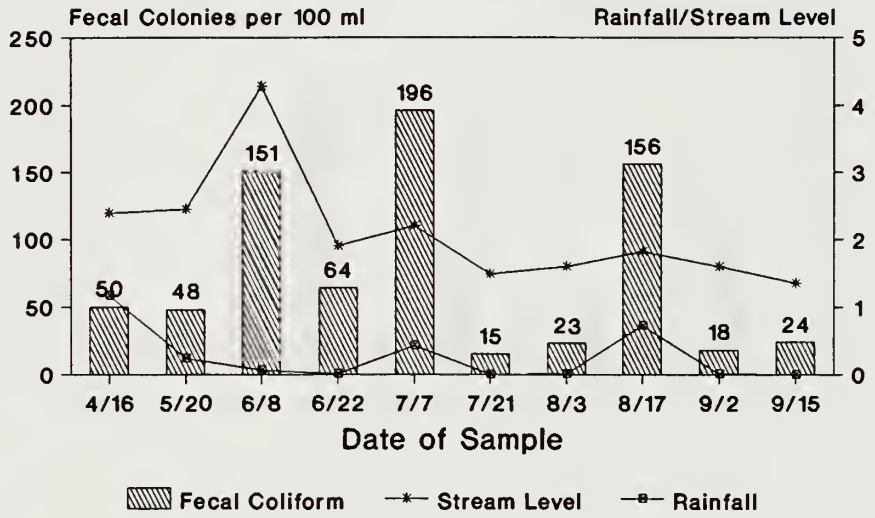


Figure 7. Fecal Coliform Data for Meadow Creek

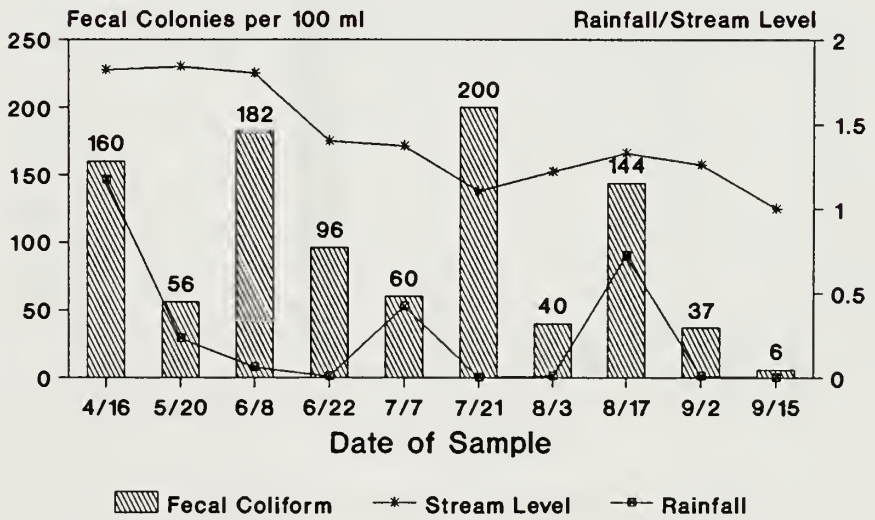


Figure 8. Fecal Coliform Data for Laurel Creek @ Quinnimont

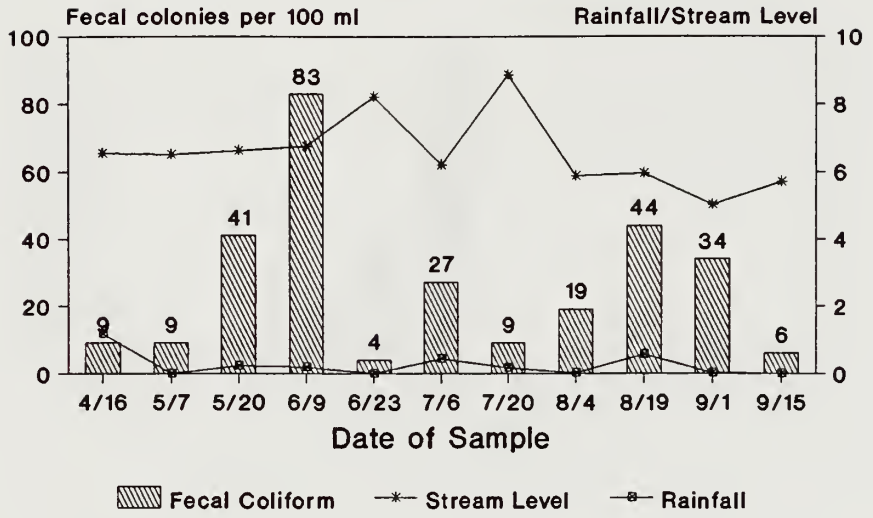


Figure 9. Fecal Coliform Data for New River @ Prince

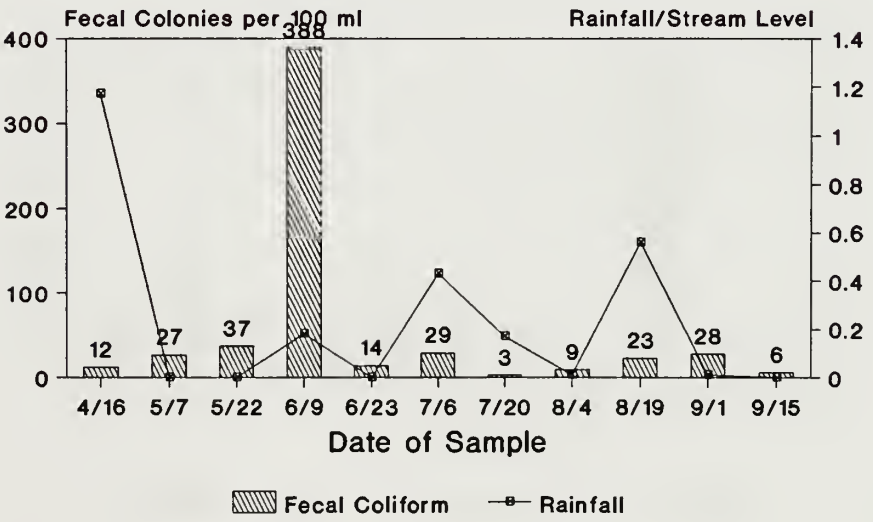


Figure 10. Fecal Coliform Data for Piney Creek

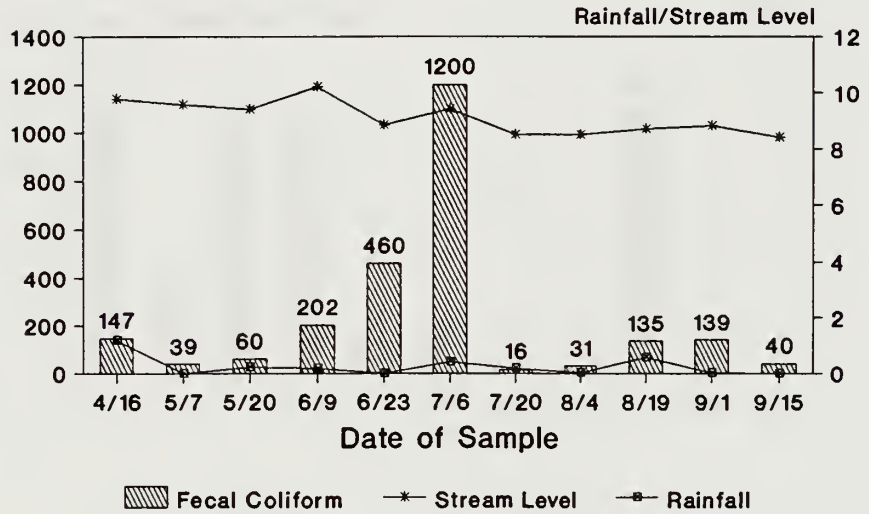


Figure 11. Fecal Coliform Data for Dunloup Creek

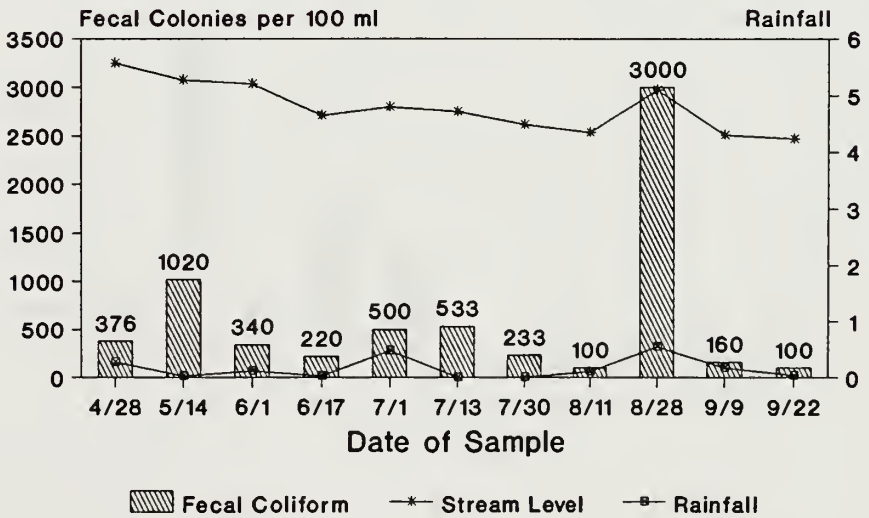


Figure 12. Fecal Coliform Data for New River @ Thurmond

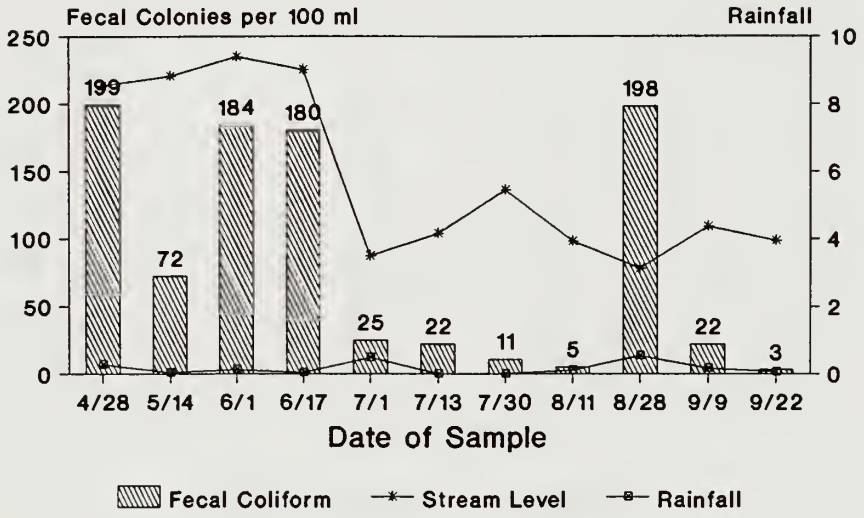


Figure 13. Fecal Coliform Data for Arbuckle Creek

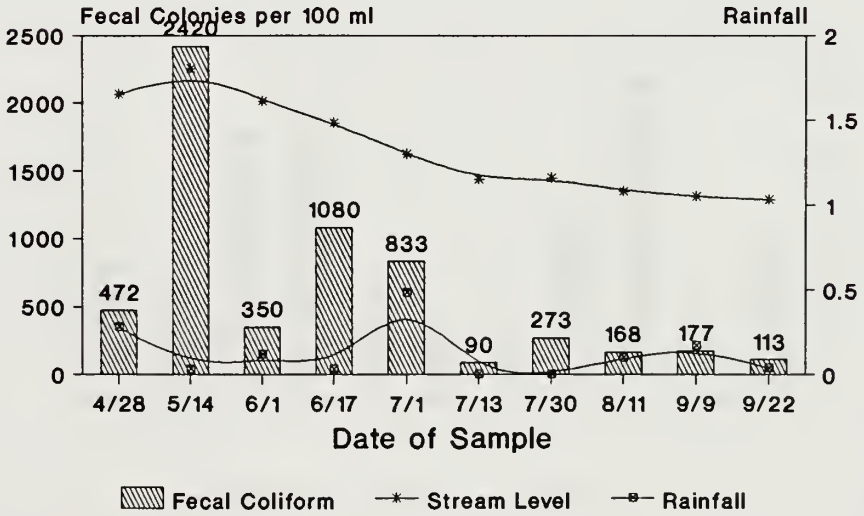


Figure 14. Fecal Coliform Data New River at Cunard

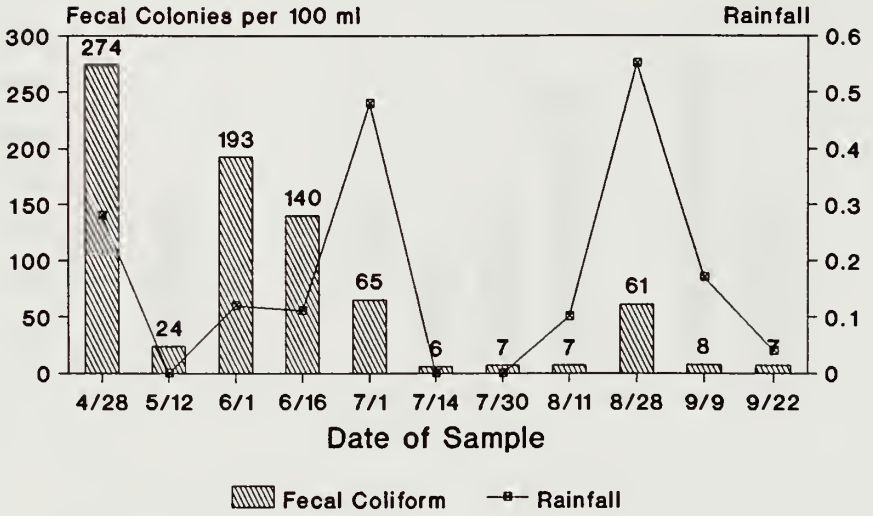


Figure 15. Fecal Coliform Data for Coal Run

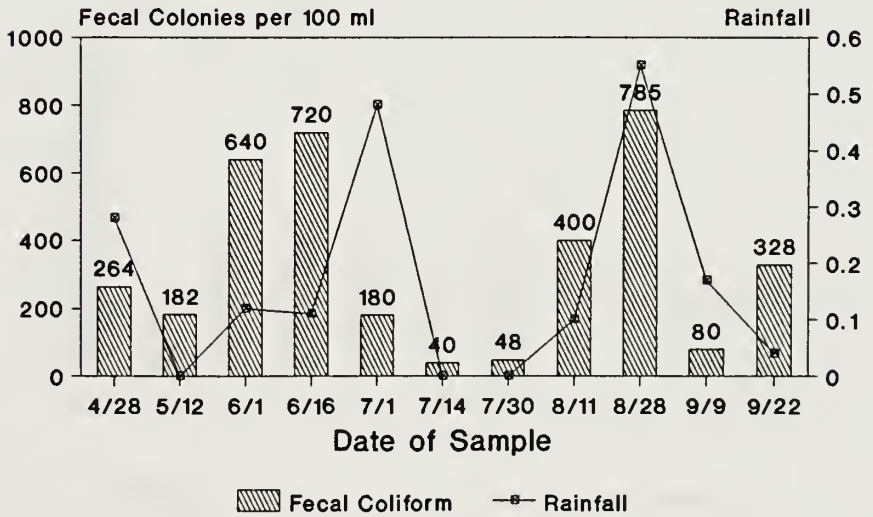


Figure 16. Fecal Coliform Data for Keeney Creek

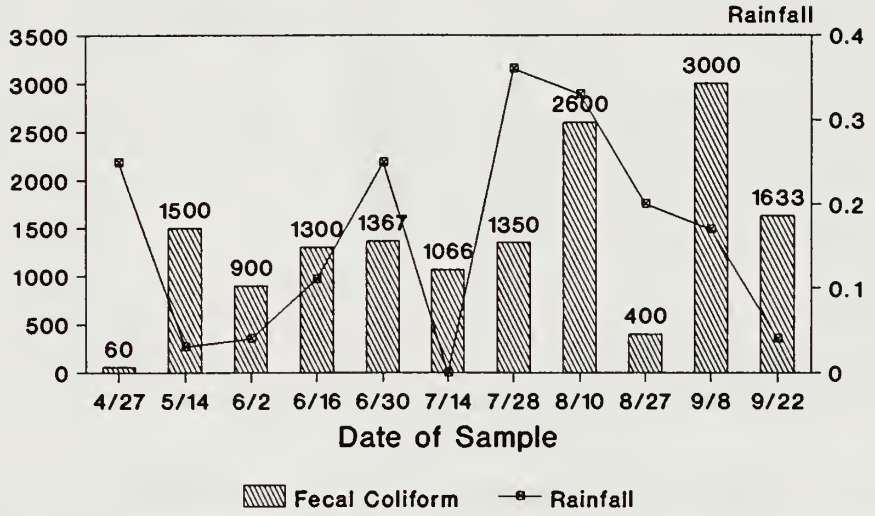


Figure 17. Fecal Coliform Data for New River @ Fayette Station

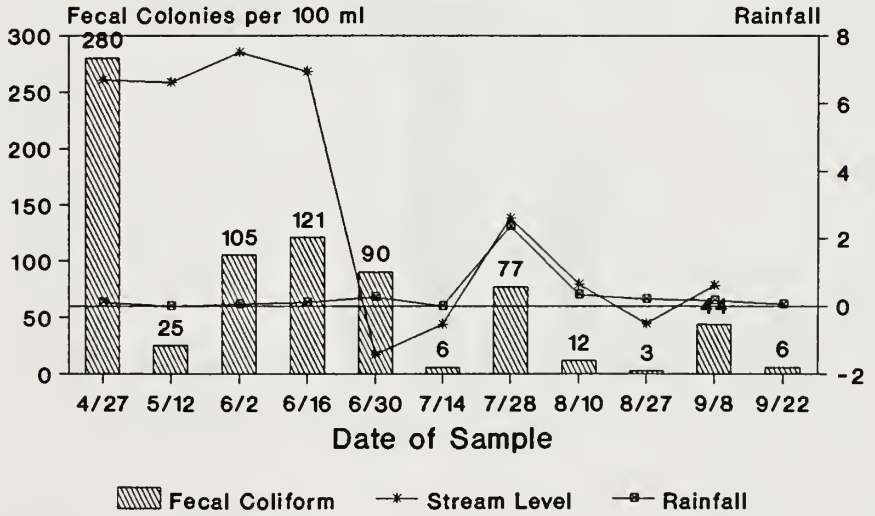
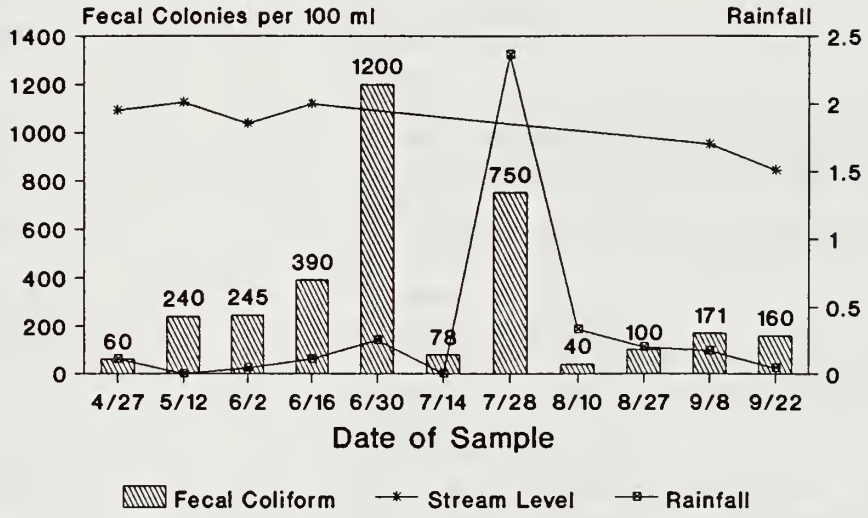
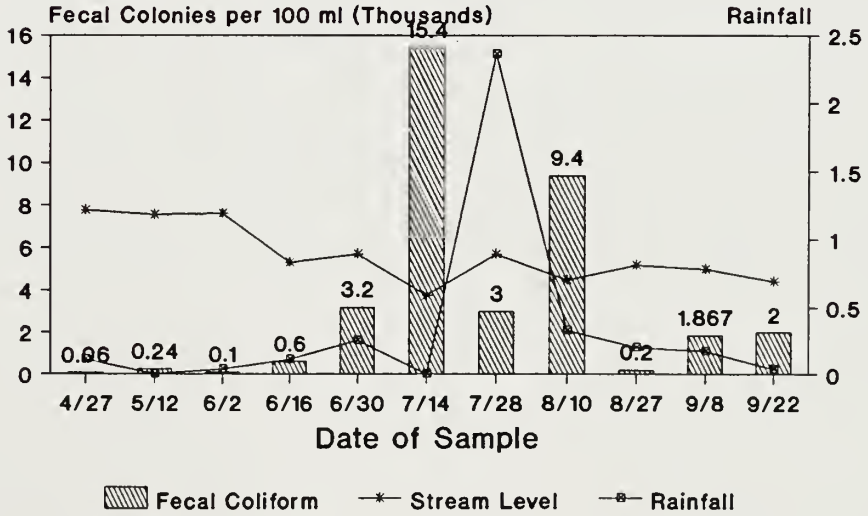


Figure 18. Fecal Coliform Data for Wolf Creek



Staff gage inoperative 6/30-8/27

Figure 19. Fecal Coliform Data for Marr Branch



APPENDICES

The section contains the appendices referred to in the report. In Appendix 5 and 6 the 0.0 values for dissolved oxygen are not accurate. The data base program printed zeros in place of blank spaces. The 0.0 represent periods when the DO meter was being serviced. the following is a key to the abbreviations used in Appendix 5 and 6.

SITE_NO	Site Number
SITE_NAME	Site Name
DATE	Date
TIME	Time
WATER_TEMP	Water Temperature (in celsius)
F_100ML	Fecal coliform colonies per 100ml of sample
AIR_TEMP	Air Temperature (in celsius)
PH	pH
STREAM_LVL	Stream level
WATER_COND	Water condition
INCUBATION	The amount of time the fecal coliform colonies were incubated in the hot water bath
DISS_OXYGN	Dissolved oxygen
DILUTIONS	The dilutions used to get the accepted fecal coliform colony reading (20 -60)
WEATHER	Weather (referred to in appendix - 2)
PRECIP_48	Precipitation in the 48 hour period preceding the date listed

FIELD DATA COLLECTION SHEET

Site		Time	H2O Temp	Air Temp	pH	Stage Level	H2O CND Trbidty	DO	Weather	Conductivity	Dilution		Fecals /100ml	Comments
01.BLUE STONE ST.PARK	8/6/92	9:50	22°c	20°c	8.6	2.35'	N, M 2.8 NTU	8.2	OVC	285	100 / 12	150 / 30	20	
2.LITTLE BLUE STONE	8/6/92	11:04	18°c	20°c	8.1		N. SL 1.1 NTU	6.5	OVC	100	50 / 9	100 / 15	EST. 15	
03.CON-FLUENCE	8/6/92	11:36	21°c	21°c	8.4	2.35'	N, SL NTU	1.2	OVC	210	100 / 17	150 / 23	15.33	
05.MT. CREEK Tribu.	8/6/92	12:29	17°c	19°c	8.0		N, M 0.7 NTU	8.7	OVC	175	75 / 4	125 / 1	EST 5.33	
04.PIPE STEM ST.PARK	8/6/92	12:57	21°c	21°c	8.7	2.35'	N, M 2.5 NTU	8.7	OVC	291	125 / 24	175 / 18	19.2	

Stage Level	8/6 2.35' 71 CFS	
Precip W/IN 48 Hours	8/6 0.00"	

BLUESTONE DAM PRECP.(LIVE PERSON) 1-466-1234
BLUESTONE RIVER STAGE (RECORDING) 1-466-0156
Other Observations and Comments:

CONTROL BEFORE: OK OK
CONTROL AFTER: OK OK

Time In: 4:03 8/6
Time Out: 4:00 8/7

Time In:
Time Out:

WEATHER CODES

I. Cloud Cover

CLR	Clear: less than 1% sky cover
SCT	Scattered: 1% to 50% sky cover
BKN	Broken: 60% to 90% sky cover
OVC	Overcast: More than 90% sky cover
-	Thin (when prefixed to the above symbols)
-x	Partial obscuration: 1% to less than 10% sky hidden by precipitation or obstruction to vision
x	Obscuration: 10% sky hidden by precipitation or obstruction to vision

II. Physical Weather

A. Weather and Obstruction to Vision Symbols

A	Hail
BS	Blowing Snow
D	Dust
F	Fog
GF	Ground Fog
H	Haze
K	Smoke
L	Drizzle
R	Rain
RW	Rain Showers
S	Snow
SW	Snow Showers
T	Thunderstorms
T+	Severe Thunderstorms
ZL	Freezing Drizzle
ZR	Freezing Rain

B. Precipitation Intensities

(-)	Light
(no sign)	Moderate
(+)	Heavy

C. Stream Conditions

First letter (volume):	Second letter(s) (velocity):	Third letter(s) (opacity):
L = low	SL = slow	C = clear
N = normal	M = moderate	MI = milky
H = high	SW = swift	MR = murky

APPENDIX 3

Phone numbers used to determine New River stage levels at Thurmond and Hinton

Following is a list of non-battery operated gauges for several area rivers. The WVWA answering service will relay levels of selected rivers when they are at paddling levels.

PHONE	RIVERS	COMMENTS
465-0493	New River (Thurmond)	Beeper gauge, 24-hour continuous update
466-0156	New River (Bluestone Dam release)	Updated 8:00 AM each day
529-5127	New & Gauley Watersheds	Updated 10:00 AM each day
	(Stage, flow & 24-hour change on all gauging stations on Bluestone, Greenbrier, Cranberry, Elk, Meadow, New & Gauley Rivers)	

GAUGE CORRELATIONS FOR NEW RIVER:

Fayette Sta. (visual)	Hinton	Thurmond	Flow (cfs)
-2	0.45	1.8	1070
-1	0.6	2.8	1700
0	0.8	3.4	2440
1	1.0	4.4	3350
2	1.2	5.1	4440
3	1.4	5.7	5820
4	1.7	6.5	7550
5	2.0	7.2	9550
6	2.4	8.0	11400
7	2.7	8.7	14100
8	3.0	9.5	17200
9	3.4	10.3	20200
10	3.7	11.2	23800

APPENDIX 4

FECAL COLIFORM BACTERIA VALUES FOR NEW RIVER GORGE N.R.

Site No.	Site Name	Date		FC/100ml	Level	Precip
01M	NEW RIVER @ HINTON VC	04/17/92	e	12	2.40	0.16
01M	NEW RIVER @ HINTON VC	05/22/92	e	91	3.90	0.00
01M	NEW RIVER @ HINTON VC	06/08/92	e	*524	7.00	0.06
01M	NEW RIVER @ HINTON VC	06/22/92	e	43	3.10	TRACE
01M	NEW RIVER @ HINTON VC	07/07/92		60	2.70	0.42
01M	NEW RIVER @ HINTON VC	07/21/92		28	2.10	0.00
01M	NEW RIVER @ HINTON VC	08/03/92		28	2.10	TRACE
01M	NEW RIVER @ HINTON VC	08/17/92		25	1.90	0.72
01M	NEW RIVER @ HINTON VC	09/02/92		32	2.20	TRACE
01M	NEW RIVER @ HINTON VC	09/15/92	e	14		0.00
02T	MADAM CREEK	04/17/92		78	NORM	0.16
02T	MADAM CREEK	05/22/92	e	172	NORM	0.00
02T	MADAM CREEK	06/08/92		*570	HIGH	0.06
02T	MADAM CREEK	06/22/92		*310	NORM	TRACE
02T	MADAM CREEK	07/07/92	e	*1700	NORM	0.42
02T	MADAM CREEK	07/21/92	e	40	NORM	0.00
02T	MADAM CREEK	08/03/92	e*	13700	LOW	TRACE
02T	MADAM CREEK	08/17/92		* 2900	NORM	0.72
02T	MADAM CREEK	09/02/92		* 5200	NORM	TRACE
02T	MADAM CREEK	09/15/92		* 9250	LOW	0.00
03M	NEW RIVER @ HINTON STP	04/17/92		24	NORM	0.16
03M	NEW RIVER @ HINTON STP	06/08/92	e *	476	HIGH	0.06
03M	NEW RIVER @ HINTON STP	06/22/92		77	HIGH	TRACE
03M	NEW RIVER @ HINTON STP	07/07/92		83	NORM	0.42
03M	NEW RIVER @ HINTON STP	07/21/92		135	NORM	0.00
03M	NEW RIVER @ HINTON STP	08/03/92		0	NORM	TRACE
03M	NEW RIVER @ HINTON STP	08/17/92	>	120	NORM	0.72
03M	NEW RIVER @ HINTON STP	09/02/92	e	73	NORM	TRACE
03M	NEW RIVER @ HINTON STP	09/16/92		13	LOW	0.00
04M	NEW RIVER @ SANDSTONE	04/17/92		4	NORM	0.16
04M	NEW RIVER @ SANDSTONE	05/22/92		30	NORM	0.00
04M	NEW RIVER @ SANDSTONE	06/08/92	e	*512	HIGH	0.06
04M	NEW RIVER @ SANDSTONE	06/22/92	e	34	NORM	TRACE
04M	NEW RIVER @ SANDSTONE	07/07/92		23	NORM	0.42
04M	NEW RIVER @ SANDSTONE	07/21/92		35	NORM	0.00
04M	NEW RIVER @ SANDSTONE	08/03/92		17	NORM	TRACE
04M	NEW RIVER @ SANDSTONE	08/17/92	e	83	LOW	0.72
04M	NEW RIVER @ SANDSTONE	09/02/92	e	13	NORM	TRACE
04M	NEW RIVER @ SANDSTONE	09/15/92	e	9	LOW	0.00
05T	LICK CREEK	04/16/92		50	2.39	1.17
05T	LICK CREEK	05/20/92		48	2.44	0.23
05T	LICK CREEK	06/08/92		151	4.28	0.06
05T	LICK CREEK	06/22/92		64	1.90	TRACE
05T	LICK CREEK	07/07/92		196	2.20	0.42
05T	LICK CREEK	07/21/92	e	15	1.48	0.00
05T	LICK CREEK	08/03/92		23	1.60	TRACE
05T	LICK CREEK	08/17/92		156	1.82	0.72
05T	LICK CREEK	09/02/92	e	18	1.60	TRACE
05T	LICK CREEK	09/15/92	e	24	1.35	0.00
06T	MEADOW CREEK	04/16/92		160	1.82	1.17
06T	MEADOW CREEK	05/20/92		56	1.84	0.23

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ite	No.	Site Name	Date	FC/100ml	Level	Precip
6T		MEADOW CREEK	06/08/92	182	HIGH	0.06
6T		MEADOW CREEK	06/22/92	96	~1.40	TRACE
6T		MEADOW CREEK	07/07/92	60	1.37	0.42
6T		MEADOW CREEK	07/21/92	> 200	1.10	0.00
6T		MEADOW CREEK	08/03/92e	40	1.22	TRACE
6T		MEADOW CREEK	08/17/92	144	1.33	0.72
6T		MEADOW CREEK	09/02/92e	37	1.26	TRACE
6T		MEADOW CREEK	09/15/92e	6	1.00	0.00
7T		LAUREL CREEK @ QUINNIMONT	04/16/92e	9	6.54	1.17
7T		LAUREL CREEK @ QUINNIMONT	05/07/92e	9	6.50	0.00
7T		LAUREL CREEK @ QUINNIMONT	05/20/92	41	6.63	0.23
7T		LAUREL CREEK @ QUINNIMONT	06/09/92	83	6.75	0.18
7T		LAUREL CREEK @ QUINNIMONT	06/23/92e	4	8.20	0.00
7T		LAUREL CREEK @ QUINNIMONT	07/06/92	27	6.20	0.43
7T		LAUREL CREEK @ QUINNIMONT	07/20/92e	9	8.86	0.17
7T		LAUREL CREEK @ QUINNIMONT	08/04/92	19	5.88	TRACE
7T		LAUREL CREEK @ QUINNIMONT	08/19/92	44	5.95	0.56
7T		LAUREL CREEK @ QUINNIMONT	09/01/92	34	5.02	TRACE
7T		LAUREL CREEK @ QUINNIMONT	09/15/92e	6	5.70	0.00
3M		NEW RIVER @ PRINCE	04/16/92e	12	2.70	1.17
3M		NEW RIVER @ PRINCE	05/07/92	27	NORM	0.00
3M		NEW RIVER @ PRINCE	05/22/92	37	HIGH	0.00
3M		NEW RIVER @ PRINCE	06/09/92e	*388	HIGH	0.18
3M		NEW RIVER @ PRINCE	06/23/92e	14	HIGH	0.00
3M		NEW RIVER @ PRINCE	07/06/92	29	NORM	0.43
3M		NEW RIVER @ PRINCE	07/20/92e	3	NORM	0.17
3M		NEW RIVER @ PRINCE	08/04/92e	9	NORM	TRACE
3M		NEW RIVER @ PRINCE	08/19/92	23	NORM	0.56
3M		NEW RIVER @ PRINCE	09/01/92	28	NORM	TRACE
3M		NEW RIVER @ PRINCE	09/15/92e	6	LOW	0.00
9T		PINEY CREEK @ McCREERY	04/16/92	147	9.78	1.17
9T		PINEY CREEK @ McCREERY	05/07/92	39	9.56	
9T		PINEY CREEK @ McCREERY	05/20/92	> 60	9.42	0.23
9T		PINEY CREEK @ McCREERY	06/09/92	*202	10.20	0.18
9T		PINEY CREEK @ McCREERY	06/23/92	*460	8.84	0.00
9T		PINEY CREEK @ McCREERY	07/06/92	> *1200	9.40	0.43
9T		PINEY CREEK @ McCREERY	07/20/92e	16	8.50	0.17
9T		PINEY CREEK @ McCREERY	08/04/92	31	8.50	TRACE
9T		PINEY CREEK @ McCREERY	08/19/92	135	8.70	0.56
9T		PINEY CREEK @ McCREERY	09/01/92	139	8.82	TRACE
9T		PINEY CREEK @ McCREERY	09/15/92e	40	8.40	0.00
1T		DUNLOUP CREEK	04/28/92e	*376	5.57	0.28
1T		DUNLOUP CREEK	05/14/92e	*1020	5.27	0.03
1T		DUNLOUP CREEK	06/01/92	*340	HIGH	0.12
1T		DUNLOUP CREEK	06/17/92	*220	NORM	0.03
1T		DUNLOUP CREEK	07/01/92	*500	4.79	0.48
1T		DUNLOUP CREEK	07/13/92	*533	NORM	0.00
1T		DUNLOUP CREEK	07/30/92	*233	4.49	0.00
1T		DUNLOUP CREEK	08/11/92e	100	4.35	0.10
1T		DUNLOUP CREEK	08/28/92	> *3000	5.10	0.55
1T		DUNLOUP CREEK	09/09/92e	160	4.30	0.17
1T		DUNLOUP CREEK	09/22/92e	100	4.24	0.04

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12M	NEW RIVER @ THURMOND	04/28/92e	199	8.52	0.28
12M	NEW RIVER @ THURMOND	05/14/92e	72	8.82	0.03
12M	NEW RIVER @ THURMOND	06/01/92	184	9.38	0.12
12M	NEW RIVER @ THURMOND	06/17/92	180	9.00	0.03
12M	NEW RIVER @ THURMOND	07/01/92 e	25	3.48	0.48
12M	NEW RIVER @ THURMOND	07/13/92 e	22	4.14	0.00
12M	NEW RIVER @ THURMOND	07/30/92 e	11	5.45	0.00
12M	NEW RIVER @ THURMOND	08/11/92 e	5	3.92	0.10
12M	NEW RIVER @ THURMOND	08/28/92 e	198	3.11	0.55
12M	NEW RIVER @ THURMOND	09/09/92	22	4.35	0.17
12M	NEW RIVER @ THURMOND	09/22/92 e	3	LOW	0.04
13T	ARBUCKLE CREEK	04/28/92 e	*472	1.65	0.28
13T	ARBUCKLE CREEK	05/14/92 e	*2420	1.80	0.03
13T	ARBUCKLE CREEK	06/01/92	*350	NORM	0.12
13T	ARBUCKLE CREEK	06/17/92	*1080	1.48	0.03
13T	ARBUCKLE CREEK	07/01/92	*833	1.30	0.48
13T	ARBUCKLE CREEK	07/13/92 e	90	1.15	0.00
13T	ARBUCKLE CREEK	07/30/92	*273	1.16	0.00
13T	ARBUCKLE CREEK	08/11/92	168	1.08	0.10
13T	ARBUCKLE CREEK	09/09/92	177	LOW	0.17
13T	ARBUCKLE CREEK	09/22/92	113	1.03	0.04
14M	NEW RIVER @ CUNARD	04/28/92 e	*274	HIGH	0.28
14M	NEW RIVER @ CUNARD	05/12/92 e	24	HIGH	0.00
14M	NEW RIVER @ CUNARD	06/01/92	193	HIGH	0.12
14M	NEW RIVER @ CUNARD	06/16/92	140	HIGH	0.11
14M	NEW RIVER @ CUNARD	07/01/92 e	65	NORM	0.48
14M	NEW RIVER @ CUNARD	07/14/92 e	6	NORM	0.00
14M	NEW RIVER @ CUNARD	07/30/92 e	7	NORM	0.00
14M	NEW RIVER @ CUNARD	08/11/92 e	5	NORM	0.10
14M	NEW RIVER @ CUNARD	08/28/92 e	61	LOW	0.55
14M	NEW RIVER @ CUNARD	09/09/92 e	8	NORM	0.17
14M	NEW RIVER @ CUNARD	09/22/92 e	7	LOW	0.04
15T	COAL RUN	04/28/92 e	*264	HIGH	0.28
15T	COAL RUN	05/12/92	182	NORM	0.00
15T	COAL RUN	06/01/92 e	*640	NORM	0.12
15T	COAL RUN	06/16/92	*720	NORM	0.11
15T	COAL RUN	07/01/92 e	180	NORM	0.48
15T	COAL RUN	07/14/92 e	40	NORM	0.00
15T	COAL RUN	07/30/92 e	48	LOW	0.00
15T	COAL RUN	08/11/92 e	*400	NORM	0.10
15T	COAL RUN	08/28/92	*785	HIGH	0.55
15T	COAL RUN	09/09/92	80	LOW	0.17
15T	COAL RUN	09/22/92	*328	LOW	0.04
16T	KEENEY'S CREEK	04/27/92	> 60	HIGH	0.25
16T	KEENEY'S CREEK	05/14/92 e	*1500	HIGH	0.03
16T	KEENEY'S CREEK	06/02/92 e	*900	NORM	0.04
16T	KEENEY'S CREEK	06/16/92 e	*1300	NORM	0.11
16T	KEENEY'S CREEK	06/30/92	*1367	LOW	0.25
16T	KEENEY'S CREEK	07/14/92	*1066	NORM	0.00
16T	KEENEY'S CREEK	07/28/92	*1350	HIGH	2.36
16T	KEENEY'S CREEK	08/10/92	*2600	LOW	0.33
16T	KEENEY'S CREEK	08/27/92	> *400	LOW	0.20

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16T	KEENEY'S CREEK	09/08/92	*3000	NORM	0.17
16T	KEENEY'S CREEK	09/22/92	*1633	LOW	0.04
17M	NEW RIVER @ FAYETTE STATION	04/27/92 e	*280	6.69	0.11
17M	NEW RIVER @ FAYETTE STATION	05/12/92 e	25	6.61	0.00
17M	NEW RIVER @ FAYETTE STATION	06/02/92	105	7.51	0.04
17M	NEW RIVER @ FAYETTE STATION	06/16/92	121	6.94	0.11
17M	NEW RIVER @ FAYETTE STATION	06/30/92	90	-1.42	0.25
17M	NEW RIVER @ FAYETTE STATION	07/14/92 e	6	-0.53	0.00
17M	NEW RIVER @ FAYETTE STATION	07/28/92 e	77	2.60	2.36
17M	NEW RIVER @ FAYETTE STATION	08/10/92	12	0.64	0.33
17M	NEW RIVER @ FAYETTE STATION	08/27/92	3	-0.52	0.20
17M	NEW RIVER @ FAYETTE STATION	09/08/92	44	0.60	0.17
17M	NEW RIVER @ FAYETTE STATION	09/22/92 e	6	LOW	0.04
18T	WOLF CREEK	04/27/92	> 60	1.95	0.11
18T	WOLF CREEK	05/12/92	> *240	2.01	0.00
18T	WOLF CREEK	06/02/92	*245	1.85	0.04
18T	WOLF CREEK	06/16/92	*390	2.00	0.11
18T	WOLF CREEK	06/30/92	> *1200	NORM	0.25
18T	WOLF CREEK	07/14/92 e	78	NORM	0.00
18T	WOLF CREEK	07/28/92	> *750	NORM	2.36
18T	WOLF CREEK	08/10/92 e	40	LOW	0.33
18T	WOLF CREEK	08/27/92 e	100	LOW	0.20
18T	WOLF CREEK	09/08/92	> 171	1.70	0.17
18T	WOLF CREEK	09/22/92 e	160	LOW	0.04
19T	MARR BRANCH	04/27/92 e	60	1.21	0.11
19T	MARR BRANCH	05/12/92	> *240	1.18	0.00
19T	MARR BRANCH	06/02/92	100	1.19	0.04
19T	MARR BRANCH	06/16/92	> *600	0.83	0.11
19T	MARR BRANCH	06/30/92	*3200	0.89	0.25
19T	MARR BRANCH	07/14/92e	*15400	0.59	0.00
19T	MARR BRANCH	07/28/92 e	*3000	0.89	2.36
19T	MARR BRANCH	08/10/92	*9400	0.70	0.33
19T	MARR BRANCH	08/27/92 e	200	NORM	0.20
19T	MARR BRANCH	09/08/92	*1867	0.78	0.17
19T	MARR BRANCH	09/22/92	> *2000	0.69	0.04

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APPENDIX 5
RAW DATA FOR 1992 WATER QUALITY MONITORING PROGRAM

SITE NO	SITE NAME	DATE	TIME	WaterTEMP	FC/100ml	AIRTEMP	pH	STRMLVL	N2OCONDITION/NTU	INCUB	DO	DILUTIONS	WEATHER	CONDUCT	PRECIP	COMMENTS
01M	NEW RIVER @ HINTON VC	04/17/92	1:25	15.0	12	22.0	7.3	2.40	N, SL, MI, 4.7 NTU	23:00	9.40	150ML:18/100ML:11	OVC, R	120.0	0.16	EST. FECAL VALUE=12/100ML.
01M	NEW RIVER @ HINTON VC	05/22/92	1:08	18.0	91	27.0	7.7	3.90	N, M, MR, 12.5 NTU	29:00	9.00	100ML:91/150ML:125	CLR	112.0	0.00	EST. FECAL VALUE=91/100ML.
01M	NEW RIVER @ HINTON VC	06/08/92	1:25	17.0	524	29.0	6.9	7.00	N, SW,TURBD, 25 NTU	22:30	10.20	25ML:131/50ML:218	OVC	92.0	0.06	EST. FECAL VALUE=524/100ML.
01M	NEW RIVER @ HINTON VC	06/22/92	1:20	21.0	43	25.0	7.8	3.10	N, M, MI, 16 NTU	23:00	8.90	25ML:10/35ML:15	CLR	124.0	TRACE	EST. FECAL VALUE=42.9/100ML.
01M	NEW RIVER @ HINTON VC	07/07/92	1:10	25.0	60	29.0	8.1	2.70	N, M, 5.7 NTU	23:00	8.20	50ML:18/100ML:60	SCT	152.0	0.42	
01M	NEW RIVER @ HINTON VC	07/21/92	1:47	29.0	28	30.0	7.8	2.10	N, M, CLR, 4.2 NTU	23:00	7.10	50ML:11/100ML:28	SCT	170.0	0.00	
01M	NEW RIVER @ HINTON VC	08/03/92	11:07	25.0	28	23.0	7.8	2.10	N, SL, MI, 3.9 NTU	23:05	7.80	100ML:32/150ML:35	OVC, F	160.0	TRACE	EST.FECAL VALUE=27.7/100ML.
01M	NEW RIVER @ HINTON VC	08/17/92	1:11	26.0	25	23.0	7.8	1.90	N, M, CLR, 4.1 NTU	22:00	7.30	100ML:24/150ML:40	OVC	161.0	0.72	
01M	NEW RIVER @ HINTON VC	09/02/92	10:20	23.5	32	21.0	7.8	2.20	N, SL, MI, 5.1 NTU	24:00	8.60	100ML:28/125ML:44	BKN, N	140.0	TRACE	
01M	NEW RIVER @ HINTON VC	09/15/92	12:55	25.0	14	29.5	7.2		2.5 NTU	22:15	7.90	100ML:6.0/125ML:18	CLR	145.0	0.00	EST. FECAL VALUE=14.4/100ML; pH READINGS TAKEN IN LAB.
02T	MADAM CREEK	04/17/92	12:45	14.0	78	24.0	7.2	NORM	N, SL, MI, 7.0 NTU	23:00	9.80	100ML:18/50ML:39	OVC	72.0	0.16	
02T	MADAM CREEK	05/22/92	12:50	15.0	172	28.0	7.8	NORM	N, M, 9.4 NTU	29:00	9.60	50ML:86/100ML:141	CLR	70.0	0.00	EST. FECAL VALUE=172/100ML.
02T	MADAM CREEK	06/08/92	1:45	17.5	570	30.0	7.0	HIGN	N, SW,TURBD, 17 NTU	22:30	9.20	10ML:57/25ML:137	OVC	70.0	0.06	
02T	MADAM CREEK	06/22/92	1:40	17.0	310	28.0	7.9	NORM	N, SL, CLR, 3.5 NTU	23:00	9.80	5ML:13/10ML:31	CLR	102.0	TRACE	
02T	MADAM CREEK	07/07/92	1:30	20.0	1700	29.0	7.9	NORM	N, M, 5.1 NTU	23:00	8.80	5.0ML:85/10ML:143	BKN-	102.0	0.42	EST. FECAL VALUE=1700/100ML.
02T	MADAM CREEK	07/21/92	1:19	26.0	40	32.0	8.3	NORM	N, SL, CLR, 3.2 NTU	23:00	7.90	3.0ML:1.0/10ML:4.0	SCT	202.0	0.00	EST.FECAL VALUE=40/100ML.
02T	MADAM CREEK	08/03/92	11:30	20.0	13700	28.0	8.3	LOW	L, SL, MR, 19 NTU	23:05	9.20	1.0ML:137/4.0ML:TNTC	OVC, F	170.0	TRACE	EST. FECAL VALUE=13,700/100ML.
02T	MADAM CREEK	08/17/92	12:56	21.0	2900	24.0	8.1	NORM	N, M, MI, 2.5 NTU	22:00	8.60	0.5ML:16/1.0ML:29	OVC	135.0	0.72	
02T	MADAM CREEK	09/02/92	12:25	19.0	5200	26.0	8.5	NORM	N, SL, CLR, 3.5 NTU	24:00	10.00	0.5ML:32/1.0ML:40	BKN, N	140.0	TRACE	
02T	MADAM CREEK	09/15/92	1:55	21.0	9250	25.5	8.1	LOW	3.6 NTU	22:15	10.60	0.5ML:48/1.0ML:89	CLR	182.0	0.00	pH READINGS TAKEN IN LAB.
03M	NEW RIVER @ HINTON STP	04/17/92	11:30	15.0	24	22.0	7.5	NORM	N, M, CLR, 2.3 NTU	23:00	10.20	150ML:76/100ML:24	BKN	98.0	0.16	
03M	NEW RIVER @ HINTON STP	06/08/92	11:14	17.0	476	27.0	6.9	NIGN	N, SW,TURBD,20. NTU	22:30	9.40	25ML:119/50ML:102	SCT	89.0	0.06	EST. FECAL VALUE=476/100ML.
03M	NEW RIVER @ HINTON STP	06/22/92	11:30	20.0	77	19.0	8.6	NIGN	N, SW, MI, 4.6 NTU	23:00	9.80	25ML:16/35ML:27	CLR	128.0	TRACE	
03M	NEW RIVER @ HINTON STP	07/07/92	11:05	23.0	83	28.0	8.2	NORM	N, M, MI, 4.5 NTU	23:00	8.60	40ML:33/80ML:72	SCT	145.0	0.42	EST. FECAL VALUE=82.5/100ML.
03M	NEW RIVER @ HINTON STP	07/21/92	11:39	27.0	135	27.0	8.1	NORM	N, M, SLR, 4.1 NTU	23:00	7.50	30ML:30/60ML:51	SCT	171.0	0.00	
03M	NEW RIVER @ HINTON STP	08/03/92	12:55	25.0	0	26.0	8.4	NORM	N, M, MI, 3.7 NTU		8.50	/	BKN	159.0	TRACE	SAMPLE WAS LOST DUE TO DAMAGED SAMPLE BOTTLE.
03M	NEW RIVER @ HINTON STP	08/17/92	1:44	25.0	120	23.0	8.3	NORM	N, M, CLR, 2.6 NTU	22:00	7.60	50ML:TNTC/100ML:TNTC	OVC	166.0	0.72	EST. FECAL VALUE ¢120/100ML.
03M	NEW RIVER @ HINTON STP	09/02/92	12:50	23.5	73	27.0	8.5	NORM	N, M, MI, 3.0 NTU	24:00	9.60	10ML:7.0/15ML:11	BKN, N	170.0	TRACE	EST. FECAL VALUE=73.3/100ML.
03M	NEW RIVER @ HINTON STP	09/16/92	1:45	25.0	13	28.0	8.5	LOW	L, SL, CLR, 1.4 NTU	22:15	9.90	10ML:0/15ML:2.0	CLR	150.0	0.00	pH READINGS TAKEN IN LAB.
04M	NEW RIVER @ SANDSTONE	04/17/92	12:15	15.0	4	22.0	7.6	NORM	N, M, MI 3.1 NTU	23:00	9.40	150ML:4/100ML:4	BKN	105.0	0.16	EST. FECAL VALUE=4.0/100ML.
04M	NEW RIVER @ SANDSTONE	05/22/92	12:14	19.0	30	27.0	8.3	NORM	N, M, MI, 7.8 NTU	29:00	9.40	100ML:36/150ML:37	CLR	111.0	0.00	
04M	NEW RIVER @ SANDSTONE	06/08/92	12:14	18.0	512	27.0	7.0	NIGN	N, SW,TURBD,27. NTU	22:30	9.20	25ML:128/50ML:205	SCT	92.0	0.06	EST. FECAL VALUE=512/100ML.
04M	NEW RIVER @ SANDSTONE	06/22/92	12:05	20.0	34	20.0	8.3	NORM	N, SL, MR, 11.0 NTU	23:00	9.30	25ML:7/35ML:12	CLR	245.0	TRACE	EST. FECAL VALUE=34/100ML.
04M	NEW RIVER @ SANDSTONE	07/07/92	11:50	24.0	23	25.0	8.0	NORM	N, SL, MI, 5.3 NTU	23:00	8.30	50ML:10/100ML:23	SCT	150.0	0.42	SAMPLE SITE IN SCUMMY BACKWATER.
04M	NEW RIVER @ SANDSTONE	07/21/92	12:32	29.0	35	32.0	8.4	NORM	N, SL, CLR, 4.0 NTU	23:00	8.50	100ML:14/150ML:52	SCT	168.0	0.00	EST. FECAL VALUE=34.7/100ML.
04M	NEW RIVER @ SANDSTONE	08/03/92	12:00	26.0	17	27.0	8.1	NORM	N, SL, MR, 4.0 NTU	23:05	9.00	100ML:10/150ML:21	BKN	170.0	TRACE	
04M	NEW RIVER @ SANDSTONE	08/17/92	12:17	26.0	83	23.0	7.7	LOW	N, SL, CLR, 3.3 NTU	22:00	7.00	100ML:83/150ML:108	OVC	160.0	0.72	EST. FECAL VALUE=83/100ML.
04M	NEW RIVER @ SANDSTONE	09/02/92	11:30	24.0	13	25.0	7.6	NORM	N, SL, MI, 3.7 NTU	24:00	8.50	100ML:15/125ML:16	BKN, N	140.0	TRACE	EST. FECAL VALUE=12.8/100ML.
04M	NEW RIVER @ SANDSTONE	09/15/92	1:45	26.0	9	30.5	8.0	LOW	L, SL, CL, 3.9 NTU	22:15	9.00	100ML:7.0/125ML:11	CLR	155.0	0.00	EST. FECAL VALUE=8.8/100ML; pH READINGS TAKEN IN LAB.

SITE NO	SITE NAME	DATE	TIME	WaterTEMP	FC/100ml	AIRTEMP	pH	STRMLVL	H2OCONDITION/NTU	INCUB	OO	DILUTIONS	WEATHER	CONDUCT	PRECIP	COMMENTS
05T	LICK CREEK	04/16/92	12:10	13.0	50	16.0	6.8	2.39	N, SW, MI, 3.5 NTU	23:00	0.00	30ML:19/50ML:25	OVC	110.0	1.17	
05T	LICK CREEK	05/20/92	12:42	17.0	48	20.0	8.3	2.44	N, M, MI, 4.9 NTU	22:00	9.60	50ML:18/100ML:48	SCT	110.0	0.23	
05T	LICK CREEK	06/08/92	10:30	16.0	151	27.0	6.9	4.28	H, M, TURBD, 12 NTU	22:30	9.60	10ML:25/25ML:44	SCT	100.0	0.06	
05T	LICK CREEK	06/22/92	10:50	14.0	64	21.0	7.3	1.90	N, M, CLR, 1.6 NTU	23:00	10.10	35ML:20/50ML:35	CLR	148.0	TRACE	
05T	LICK CREEK	07/07/92	10:25	19.0	196	25.0	7.6	2.20	N, M, MR, 7.5 NTU	23:00	8.90	25ML:49/50ML:94	SCT	151.0	0.42	
05T	LICK CREEK	07/21/92	11:02	22.0	15	28.0	8.3	1.48	CLR, 2.1 NTU	23:00	8.50	40ML:6/60ML:9	SCT	281.0	0.00	EST. FECAL VALUE=15/100ML.
05T	LICK CREEK	08/03/92	1:30	23.0	23	30.0	8.5	1.60	L, SL, CLR, 2.7 NTU	23:05	9.40	100ML:20/150ML:39	SCT	292.0	TRACE	
05T	LICK CREEK	08/17/92	11:16	22.0	156	23.0	8.2	1.82	N, M, CLR, 5.1 NTU	22:00	8.50	25ML:39/50ML:62	OVC, R	220.0	0.72	
05T	LICK CREEK	09/02/92	1:30	21.0	18	27.0	8.5	1.60	L, SL, CLR, 3.1 NTU	24:00	10.20	25ML:4.0/50ML:9.0	BKN, H	280.0	TRACE	EST. FECAL VALUE=18/100ML.
05T	LICK CREEK	09/15/92	11:50	19.0	24	26.0	7.5	1.35	L, SL, CLR, 1.3 NTU	22:15	9.60	25ML:7.0/50ML:12	CLR	335.0	0.00	EST. FECAL VALUE=24/100ML; pH READINGS TAKEN IN LAB.
06T	MEADOW CREEK	04/16/92	11:40	11.0	160	15.0	6.6	1.82	N, SW, MR, 5.3 NTU	23:00	0.00	30ML:48/50ML:93	OVC	70.0	1.17	
06T	MEADOW CREEK	05/20/92	12:19	15.0	56	25.0	6.4	1.84	N, M, MR, 13.5 NTU	22:00	12.60	60ML:34/100ML:55	SCT	73.0	0.23	
06T	MEADOW CREEK	06/08/92	10:10	15.0	182	25.0	6.4	HIGH	H, SW,TURBD,1.7 NTU	22:30	9.70	10ML:20/25ML:41	OVC, F	62.0	0.06	STAFF GAGE BROKEN.
06T	MEADOW CREEK	06/22/92	10:30	13.0	96	15.0	6.5	™1.40	N, SW, CLR, 2.8 NTU	23:00	10.60	25ML:21/35ML:38	CLR	105.0	TRACE	
06T	MEADOW CREEK	07/07/92	9:55	17.0	60	19.0	6.9	1.37	N, M, CLR, 4.1 NTU	23:00	9.60	25ML:16/40ML:24	SCT	125.0	0.42	
06T	MEADOW CREEK	07/21/92	10:31	21.0	200	24.0	8.3	1.10	L, SL, CLR, 2.3 NTU	23:00	8.70	30ML:TNTC/60ML:TNTC	SCT	178.0	0.00	EST. FECAL VALUE ¢200/100ML.
06T	MEADOW CREEK	08/03/92	1:50	21.0	40	29.0	8.5	1.22	L, M, CLR, 3.2 NTU	23:05	0.00	10ML:2.0/25ML:10	SCT	150.0	TRACE	EST. FECAL VALUE=40/100ML.
06T	MEADOW CREEK	08/17/92	10:55	20.0	144	21.0	7.8	1.33	N, M, CLR, 6.3 NTU	22:00	9.30	20ML:28/40ML:59	OVC, R	122.0	0.72	EST. FECAL VALUE=143.8/100ML.
06T	MEADOW CREEK	09/02/92	1:50	18.5	37	27.0	8.5	1.26	N, M, MI, 5.7 NTU	24:00	9.60	15ML:4.0/35ML:13	OVC, H	130.0	TRACE	EST. FECAL VALUE=37.1/100ML.
06T	MEADOW CREEK	09/15/92	11:30	18.0	6	25.0	7.6	1.00	N, M, CLR, 1.25 NTU	22:15	9.60	15ML:0/35ML:2.0	CLR, H	180.0	0.00	EST. FECAL VALUE=5.7/100ML; pH READINGS TAKEN IN LAB.
07T	LAUREL CREEK @ QUINNIMONT	04/16/92	10:30	11.0	9	15.0	6.2	6.54	N, SW,CLR, 2.5 NTU	23:00	0.00	50ML:4/100ML:9	OVC	70.0	1.17	EST. FECAL VALUE=9.0/100ML.
07T	LAUREL CREEK @ QUINNIMONT	05/07/92	11:40	9.0	9	18.0	7.0	6.50	N, M, CLR, 2.0 NTU	23:00	11.00	150ML:10/200ML:18	OVC	70.0	0.00	EST. FECAL VALUE=9.0/100ML.
07T	LAUREL CREEK @ QUINNIMONT	05/20/92	11:13	14.0	41	24.0	8.8	6.63	N, M, CLR, 3.7 NTU	22:00	10.00	50ML:20/100ML:42	SCT	70.0	0.23	
07T	LAUREL CREEK @ QUINNIMONT	06/09/92	12:25	15.0	83	26.0	5.3	6.75	N, SW, 7.0 NTU	23:00	10.20	25ML:22/50ML:39	OVC	71.0	0.18	pH, TEMP, DO METER NOT FUNCTIONING PROPERLY.
07T	LAUREL CREEK @ QUINNIMONT	06/23/92	11:45	14.0	4	24.0	7.0	8.20	N, SW, CLR, 21 NTU	23:00	10.40	25ML:1.0/50ML:2.0	SCT	105.0	0.00	EST. FECAL VALUE=4.0/100ML.
07T	LAUREL CREEK @ QUINNIMONT	07/06/92	11:34	18.0	27	24.0	7.4	6.20	N, M, 2.3 NTU	23:38	9.20	75ML:19/100ML:28	OVC	125.0	0.43	
07T	LAUREL CREEK @ QUINNIMONT	07/20/92	11:30	19.5	9	0.0	8.2	8.86	L, M, CLR, 1.2 NTU	23:00	8.90	100ML:9.0/150ML:6.0	CLR	150.0	0.17	EST. FECAL VALUE=9.0/100ML.
07T	LAUREL CREEK @ QUINNIMONT	08/04/92	12:20	19.5	19	25.0	8.1	5.88	L, M, CLR, 4.0 NTU	24:00	10.40	100ML:15/200ML:38	BKN	140.0	TRACE	
07T	LAUREL CREEK @ QUINNIMONT	08/19/92	11:09	18.0	44	25.0	8.3	5.95	N, M, CLR, 1.0 NTU	23:00	9.70	100ML:44/125ML:81	SCT	138.0	0.56	
07T	LAUREL CREEK @ QUINNIMONT	09/01/92	10:00	16.0	34	17.5	8.0	5.02	N, M, CLR, 2.0 NTU	24:10	9.90	100ML:38/125ML:39	CLR	120.0	TRACE	
07T	LAUREL CREEK @ QUINNIMONT	09/15/92	10:20	18.0	6	21.0	6.9	5.70	N, M, CLR, 0.5 NTU	22:15	9.20	100ML:0/125ML:7.0	CLR, H	155.0	0.00	pH READINGS TAKEN IN LAB; EST. FECAL VALUE=5.6/100ML.
08M	NEW RIVER @ PRINCE	04/16/92	10:00	14.0	12	15.0	6.6	2.70	N, SW, 5.06 NTU	23:00	0.00	50ML:6/100ML:2	OVC	120.0	1.17	EST. FECAL VALUE=12/100ML.
08M	NEW RIVER @ PRINCE	05/07/92	11:15	15.0	27	19.0	7.6	NORM	N, M, MR, 7.4 NTU	23:00	10.60	150ML:44/200ML:51	SCT	113.0	0.00	INCUBATED CULTURES APPEARED "RUNNY".
08M	NEW RIVER @ PRINCE	05/22/92	10:13	18.0	37	25.0	7.7	HIGH	H, SW, MR, 8.4 NTU	29:00	6.20	50ML:10/100ML:37	CLR	100.0	0.00	
08M	NEW RIVER @ PRINCE	06/09/92	11:43	18.5	388	28.0	5.9	HIGH	H, SW, 26 NTU	23:00	0.00	25ML:97/50ML:155	BKN	0.0	0.18	EST. FECAL VALUE=388/100ML; pH, TEMP, AND OO METERS NOT FUNCT
08M	NEW RIVER @ PRINCE	06/23/92	11:15	20.0	14	25.0	7.5	HIGH	H, M, MR, 13 NTU	23:00	9.00	25ML:4/50ML:7	BKN	120.0	0.00	EST. FECAL VALUE=14/100ML.
08M	NEW RIVER @ PRINCE	07/06/92	11:18	24.0	29	23.0	7.8	NORM	N, M, 6.2 NTU	23:38	6.20	75ML:23/125ML:34	OVC	149.0	0.43	
08M	NEW RIVER @ PRINCE	07/20/92	11:10	27.0	3	0.0	8.1	NORM	N, M, MI, 3.8 NTU	23:00	7.40	100ML:1.0/200ML:6.0	CLR	170.0	0.17	EST. FECAL VALUE=3.0/100ML.
08M	NEW RIVER @ PRINCE	08/04/92	11:50	25.0	9	26.0	8.1	NORM	N, M, MI, 5.8 NTU	24:00	8.80	100ML:6.0/200ML:18	BKN	160.0	TRACE	EST. FECAL VALUE=9.0/100ML.
08M	NEW RIVER @ PRINCE	08/19/92	10:54	24.0	23	23.0	8.1	NORM	N, M, 4.2 NTU	23:00	5.80	100ML:26/125ML:24	SCT	164.0	0.56	EST. FECAL VALUE=22.6/100ML.
08M	NEW RIVER @ PRINCE	09/01/92	9:32	23.0	28	16.0	8.0	NORM	N, M, MI, 5.6 NTU	24:10	7.60	100ML:35/125ML:26	OVC, F	152.0	TRACE	
08M	NEW RIVER @ PRINCE	09/15/92	10:00	25.0	6	18.5	7.0	LOW	L, SL, CLR, 2.8 NTU	22:15	7.40	100ML:6.0/125ML:3.0	CLR, H	150.0	0.00	pH READING TAKEN IN LAB; EST. FECAL VALUE=6.0/100ML.

SITE NO	SITE NAME	DATE	TIME	WaterTEMP	FC/100ml	AIRTEMP	pH	STRMLVL	H2OCONDITION/NTU	INCUB	DO	DILUTIONS	WEATHER	CONDUCT	PRECIP	COMMENTS
09T	PINEY CREEK @ McCREERY	04/16/92	9:40	13.0	147	15.0	6.5	9.78	H, SW, 2.6 NTU	23:00	0.00	10ML:16/15ML:22	OVC, L	150.0	1.17	
09T	PINEY CREEK @ McCREERY	05/07/92	11:06	10.0	39	20.0	7.1	9.56	N, M, CLR, 3.0 NTU	23:00	12.90	100ML:39/150ML:61	CLR	160.0		
09T	PINEY CREEK @ McCREERY	05/20/92	10:28	16.0	60	25.0	7.3	9.42	N, M, MI, 4.5 NTU	22:00	9.60	100ML:TNTC/150ML:TNTC	SCT	180.0	0.23	FECAL COUNT ¢60/100ML.
09T	PINEY CREEK @ McCREERY	06/09/92	11:15	17.0	202	27.0	7.1	10.20	H, SW, 13 NTU	23:00	9.90	10ML:20/25ML:51	BKN	139.0	0.18	
09T	PINEY CREEK @ McCREERY	06/23/92	10:50	15.0	460	22.0	6.6	8.84	N, SW, MR, 22 NTU	23:00	10.60	10ML:46/25ML:108	BKN	220.0	0.00	
09T	PINEY CREEK @ McCREERY	07/06/92	10:59	19.5	1200	23.0	6.7	9.40	H,SW,TURBD,37.5 NTU	23:38	8.70	5.0ML:TNTC/10ML:TNTC	OVC, R	225.0	0.43	FECAL COUNTS ¢1200/100ML.
09T	PINEY CREEK @ McCREERY	07/20/92	10:45	20.0	16	24.4	8.0	8.50	N, M, CLR, 2.3 NTU	23:00	9.00	10ML:2/25ML:2/50ML:8	CLR	290.0	0.17	EST. FECAL VALUE FROM 3 DILUTIONS=16/100ML.
09T	PINEY CREEK @ McCREERY	08/04/92	12:35	17.0	31	0.0	8.2	8.50	N, M, CLR, 2.5 NTU	24:00	10.80	50ML:6.0/100ML:31	BKN	290.0	TRACE	
09T	PINEY CREEK @ McCREERY	08/19/92	9:52	18.0	135	19.0	7.8	8.70	N, M, 5.5 NTU	23:00	9.40	10ML:14/20ML:27	OVC	248.0	0.56	
09T	PINEY CREEK @ McCREERY	09/01/92	9:15	17.0	139	16.0	7.8	8.82	N, SW, MI, 6.6 NTU	24:10	9.60	15ML:20/20ML:29	OVC, F	192.0	TRACE	
09T	PINEY CREEK @ McCREERY	09/15/92	9:40	17.5	40	17.0	7.0	8.40	N, M, CLR, 2.5 NTU	22:15	9.20	15ML:3.0/20ML:8.0	CLR, H	290.0	0.00	pH READING TAKEN IN LAB; EST. FECAL VALUE=40/100ML.
11T	DUNLOUP CREEK	04/28/92	1:10	10.5	376	15.0	6.4	5.57	H, SW, 11. NTU	23:00	11.40	25ML:94/50ML:141	BKN	235.0	0.28	EST. FECAL VALUE=376/100ML
11T	DUNLOUP CREEK	05/14/92	11:40	16.0	1020	25.0	7.2	5.27	H, SW, 11. NTU	23:55	11.00	10ML:102/20ML:160	BKN	305.0	0.03	EST. FECAL VALUE=1020/100ML
11T	DUNLOUP CREEK	06/01/92	3:02	14.0	340	20.0	7.8	HIGH	H, SW, 16. NTU	22:56	11.00	10ML:34/20ML:62	OVC	310.0	0.12	
11T	DUNLOUP CREEK	06/17/92	1:50	18.0	220	25.0	7.7	NORM	N, SW, MI, 5.4 NTU	23:00	9.90	5.0ML:19/15ML:33	CLR	420.0	0.03	NO KEY FOR GAGE.
11T	DUNLOUP CREEK	07/01/92	12:32	17.0	500	22.0	6.4	4.79	N, SW, 9.0 NTU	22:08	9.60	5.0ML:25/15ML:61	OVC, R	465.0	0.48	
11T	DUNLOUP CREEK	07/13/92	10:40	19.0	533	25.0	7.5	NORM	N, SW, 5.1 NTU	22:50	9.00	5.0ML:38/15ML:46	SCT	510.0	0.00	
11T	DUNLOUP CREEK	07/30/92	12:49	19.0	233	24.0	8.5	4.49	N, M, 8.1 NTU	23:33	8.80	5.0ML:14/15ML:35	BKN	470.0	0.00	
11T	DUNLOUP CREEK	08/11/92	12:20	19.0	100	28.0	8.1	4.35	N, SW, CLR, 4.0 NTU	23:00	9.10	5.0ML:8/15ML:15	CLR	555.0	0.10	EST. FECAL VALUE=100/100ML
11T	DUNLOUP CREEK	08/28/92	12:10	18.0	3000	19.0	8.2	5.10	H, SW,TURBD, 83 NTU	23:05	9.30	2.0ML:TNTC/5.0ML:TNTC	OVC, R	338.0	0.55	FECAL COUNTS ¢3000/100ML; BACTERIAL CULTURE IN 5.0ML DILUTION
11T	DUNLOUP CREEK	09/09/92	11:05	18.0	160	28.0	8.5	4.30	L, M, MI, 2.7 NTU	23:20	9.60	2.0ML:2/5.0ML:8	CLR	500.0	0.17	EST. FECAL VALUE=160/100ML.
11T	DUNLOUP CREEK	09/22/92	11:45	19.0	100	26.5	8.1	4.24	L, SL, MI, 3.1 NTU	23:00	9.20	5.0ML:2/10ML:10	OVC	500.0	0.04	EST. FECAL VALUE=100/100ML
12M	NEW RIVER @ THURMOND	04/28/92	1:30	12.0	199	11.0	6.8	8.52	H, MD, 14. NTU	23:00	6.70	100ML:199/150ML:281	BKN	90.0	0.28	EST. FECAL VALUE=199/100ML
12M	NEW RIVER @ THURMOND	05/14/92	11:03	18.0	72	20.0	7.3	8.82	H, SL, 10. NTU	23:55	10.20	15ML:8/25ML:18	BKN	100.0	0.03	EST. FECAL VALUE=72/100ML
12M	NEW RIVER @ THURMOND	06/01/92	2:44	14.0	184	19.0	7.6	9.38	H, SW, 12. NTU	22:56	10.30	15ML:24/25ML:52	OVC	100.0	0.12	
12M	NEW RIVER @ THURMOND	06/17/92	3:15	21.0	180	24.0	7.5	9.00	H, M, MR, 22. NTU	23:00	9.00	10ML:23/20ML:26	SCT	122.0	0.03	
12M	NEW RIVER @ THURMOND	07/01/92	11:30	24.0	25	23.0	8.0	3.48	N, SL, 6. NTU	22:08	7.60	15ML:1/20ML:5	OVC, R	145.0	0.48	EST. FECAL VALUE=25/100ML.
12M	NEW RIVER @ THURMOND	07/13/92	12:05	26.0	22	30.0	7.8	4.14	N, M, 3.7 NTU	22:50	7.60	30ML:1/60ML:13	SCT	155.0	0.00	EST. FECAL VALUE=22/100ML
12M	NEW RIVER @ THURMOND	07/30/92	2:10	26.0	11	27.0	8.2	5.45	N, SL, 5.9 NTU	23:33	7.10	100ML:4/150ML:16	SCT	165.0	0.00	EST. FECAL VALUE=11/100ML
12M	NEW RIVER @ THURMOND	08/11/92	1:39	26.0	5	30.0	8.5	3.92	N, M, CLR, 2.4 NTU	23:00	8.40	100ML:3/150ML:8	SCT	175.0	0.10	EST. FECAL VALUE=5.0/100ML
12M	NEW RIVER @ THURMOND	08/28/92	11:30	25.0	198	19.0	7.9	3.11	N, SL, MI, 7. NTU	23:05	7.40	100ML:198/150ML:205	OVC, R	170.0	0.55	EST. FECAL VALUE=198/100ML
12M	NEW RIVER @ THURMOND	09/09/92	11:30	25.0	22	28.0	7.5	4.35	N, SL, MI, 3. NTU	23:20	7.50	40ML:7/100ML:22	CLR	152.0	0.17	
12M	NEW RIVER @ THURMOND	09/22/92	12:45	23.5	3	26.5	8.1	LOW	L, SL, CLR, 3.3 NTU	23:00	8.50	50ML:1/100ML:3	OVC	150.0	0.04	EST. FECAL VALUE=3.0/100ML; GAGE BROKEN.
13T	ARBUCKLE CREEK	04/28/92	2:13	8.5	472	12.0	7.0	1.65	H, SW, NTU	23:00	11.40	50ML:236/100ML:401	BKN	235.0	0.28	EST. FECAL VALUE=472/100ML
13T	ARBUCKLE CREEK	05/14/92	10:15	14.0	2420	17.0	7.2	1.80	H, SW, 26. NTU	23:55	11.40	5.0ML:121/10ML:160	OVC	210.0	0.03	EST. FECAL VALUE=2420/100ML; 10ML COLONIES NOT WELL DEFINED DU
13T	ARBUCKLE CREEK	06/01/92	1:54	13.5	350	18.0	7.7	NORM	N, SW, 5.6 NTU	22:56	10.50	10ML:35/25ML:82	BKN	312.0	0.12	
13T	ARBUCKLE CREEK	06/17/92	2:23	17.0	1080	25.0	7.4	1.48	N, SW, MI, 9.5 NTU	23:00	10.00	5.0ML:54/15ML:122	CLR	298.0	0.03	
13T	ARBUCKLE CREEK	07/01/92	12:00	17.0	833	23.0	7.7	1.30	N, SW, 10.0 NTU	22:08	9.50	1.0ML:7/3.0ML:25	OVC, R	422.0	0.48	NOTICIBLE SMELL OF SEWAGE AT SAMPLE SITE.
13T	ARBUCKLE CREEK	07/13/92	11:15	19.0	90	24.0	7.6	1.15	N, M, 5.5 NTU	22:50	8.30	3.0ML:5/10ML:9	SCT	490.0	0.00	EST. FECAL VALUE=90/100ML
13T	ARBUCKLE CREEK	07/30/92	1:25	19.0	273	23.0	8.4	1.16	N, SW, 5.2 NTU	23:33	8.70	15ML:41/25ML:62	SCT	420.0	0.00	
13T	ARBUCKLE CREEK	08/11/92	12:52	21.0	168	26.0	8.0	1.08	N, M, CLR, 5.7 NTU	23:00	8.40	15ML:28/30ML:45	CLR	520.0	0.10	
13T	ARBUCKLE CREEK	09/09/92	12:30	20.0	177	25.0	8.4	LOW	L, M, MI, 5.2 NTU	23:20	8.40	15ML:26/30ML:54	CLR	510.0	0.17	

SITE NO	SITE NAME	DATE	TIME	WaterTEMP	FC/100ml	AIRTEMP	pH	STRMLVL	H2OCONDITION/NTU	INCUB	DO	DILUTIONS	WEATHER	CONDUCT	PRECIP	COMMENTS
13T	ARBUCKLE CREEK	09/22/92	12:20	19.5	113	26.5	8.1	1.03	L, SL, MI, 5. NTU	23:00	8.20	15ML:12/30ML:34	OVC	510.0	0.04	
14M	NEW RIVER @ CUNARD	04/28/92	11:05	12.0	274	11.0	6.6	HIGH	H, MD, 16. NTU	23:00	10.60	50ML:137/100ML:229	BKN	95.0	0.28	EST. FECAL VALUE=274/100ML
14M	NEW RIVER @ CUNARO	05/12/92	11:20	17.0	24	23.0	7.4	HIGH	H, SW, 8.6 NTU	22:30	9.60	15ML:1/25ML:6	BKN	100.0	0.00	EST. FECAL VALUE=24/100ML
14M	NEW RIVER @ CUNARO	06/01/92	11:40	14.5	193	17.0	7.8	HIGH	H, SW, 18. NTU	22:56	10.00	15ML:32/25ML:43	OVC	100.0	0.12	
14M	NEW RIVER @ CUNARO	06/16/92	2:02	20.0	140	27.0	7.4	HIGH	H, M, 18. NTU	23:30	9.40	15ML:19/25ML:35	BKN	116.0	0.11	
14M	NEW RIVER @ CUNARD	07/01/92	10:20	24.0	65	23.0	7.9	NORM	N, M, 15. NTU	22:08	7.80	15ML:6/20ML:13	OVC, R	150.0	0.48	EST. FECAL VALUE=65/100ML; VISIBLE SEDIMENT INPUT FROM DEVELOPMEN
14M	NEW RIVER @ CUNARD	07/14/92	2:03	28.0	6	34.0	8.6	NORM	N, SL, 4. NTU	22:55	9.20	50ML:7/100ML:6	SCT	162.0	0.00	EST. FECAL VALUE=6.0/100ML
14M	NEW RIVER @ CUNARD	07/30/92	11:17	26.0	7	27.0	8.0	NORM	N, SL, 4.6 NTU	23:33	6.80	100ML:8/150ML:10	CLR	166.0	0.00	EST. FECAL VALUE=7.0/100ML
14M	NEW RIVER @ CUNARD	08/11/92	11:07	26.0	5	30.0	8.0	NORM	N, M, CLR, 2.7 NTU	23:00	7.50	100ML:5/200ML:10	CLR	180.0	0.10	EST. FECAL VALUE=5.0/100ML
14M	NEW RIVER @ CUNARD	08/28/92	1:30	25.0	61	18.5	8.1	LOW	L, SL, MR, 7. NTU	23:05	7.40	100ML:61/125ML:84	OVC, R	180.0	0.55	EST. FECAL VALUE=61/100ML
14M	NEW RIVER @ CUNARD	09/09/92	2:45	26.5	8	29.0	8.4	NORM	N, SL, MI, 3.7 NTU	23:20	7.60	100ML:8/150ML:12	SCT	163.0	0.17	WATER SAMPLE TAKEN OUT IN THE CENTER OF THE RIVER. EST. FECAL VAL
14M	NEW RIVER @ CUNARD	09/22/92	10:45	23.5	7	26.0	7.4	LOW	L, SL, MI, 2.2 NTU	23:00	8.00	150ML:10/250ML:17	OVC	155.0	0.04	EST. FECAL VALUE=6.8/100ML; GAGE BROKEN.
15T	COAL RUN	04/28/92	10:12	9.0	264	8.0	6.1	HIGH	H, SW, 12. NTU	23:00	11.90	25ML:66/50ML:168	BKN	190.0	0.28	EST. FECAL VALUE=264/100ML
15T	COAL RUN	05/12/92	11:40	14.0	182	22.0	7.3	NORM	N, SW, 5.8 NTU	22:30	10.50	10ML:20/25ML:41	BKN	250.0	0.00	EST. FECAL VALUE=182/100ML
15T	COAL RUN	06/01/92	11:20	13.0	640	23.0	7.5	NORM	N, SW, 9.2 NTU	22:56	10.70	10ML:64/25ML:95	OVC	285.0	0.12	EST. FECAL VALUE=640/100ML.
15T	COAL RUN	06/16/92	1:32	16.0	720	24.0	7.3	NORM	N, SW, 9.5 NTU	23:30	10.40	5.0ML:36/15ML:81	SCT	330.0	0.11	IN BOTH CULTURE DISHES, VERY LIGHT BLUE-GREEN COLONIES COMPRISED
15T	COAL RUN	07/01/92	9:49	17.0	180	22.0	7.0	NORM	N, M, 12. NTU	22:08	9.20	5.0ML:11/10ML:18	OVC, R	342.0	0.48	EST. FECAL VALUE=180/100ML
15T	COAL RUN	07/14/92	1:32	19.0	40	27.0	7.7	NORM	N, M, 10.1 NTU	22:55	9.10	5.0ML:0/15ML:6	SCT	431.0	0.00	EST. FECAL VALUE=40/100ML
15T	COAL RUN	07/30/92	10:54	18.0	48	21.0	8.1	LOW	L, M, 8.9 NTU	23:33	9.20	20ML:14/40ML:19	SCT	400.0	0.00	EST. FECAL VALUE=48/100ML
15T	COAL RUN	08/11/92	10:39	19.0	400	26.0	7.2	NORM	N, M, MI, 8.4 NTU	23:00	8.20	25ML:100/50ML:165	CLR	428.0	0.10	EST FECAL VALUE=400/100ML
15T	COAL RUN	08/28/92	1:05	18.0	785	18.5	8.1	HIGH	H,SW,TURBID,100+NTU	23:05	9.50	5.0ML:50/10ML:57	OVC, R	232.0	0.55	FILTERED WATER SAMPLE HAD HEAVY SEDIMENT DEPOSIT ON FILTER PAPER
15T	COAL RUN	09/09/92	2:20	19.0	80	26.5	8.2	LOW	L, SL, MI, 7.6 NTU	23:20	8.90	10ML:4/25ML:20	SCT	420.0	0.17	
15T	COAL RUN	09/22/92	10:57	19.5	328	22.0	7.8	LOW	L, SL, MI, 6. NTU	23:00	8.40	10ML:44/25ML:54	OVC	410.0	0.04	
16T	KEENEY'S CREEK	04/27/92	11:15	9.5	60	10.0	6.3	HIGH	H, SW, 2.5 NTU	24:20	10.60	100ML:TNTC/150ML:TNTC	OVC	80.00	.25	FECALS PER 100ML GREATER THAN 60
16T	KEENEY'S CREEK	05/14/92	12:40	14.0	1500	27.0	7.0	HIGH	H, SW, 2.4 NTU	23:55	11.20	10ML:0/20ML:300	BKN	95.0	0.03	EST. FECAL VALUE=1500/100ML; POSSIBLY THE 10ML DILUTION DID NOT
16T	KEENEY'S CREEK	06/02/92	10:31	11.5	900	25.0	6.4	NORM	N, M, 2.7 NTU	23:00	10.40	10ML:90/20ML:114	BKN	98.0	0.04	EST. FECAL VALUE=900/100ML; SAMPLE BOTTLE NOT TREATED WITH SODIUM
16T	KEENEY'S CREEK	06/16/92	10:20	15.0	1300	24.0	6.1	NORM	N, M, 2.5 NTU	23:30	10.00	1.0ML:13/5.0ML:82	SCT	122.0	0.11	EST. FECAL VALUE=1300/100ML.
16T	KEENEY'S CREEK	06/30/92	10:06	16.5	1367	25.0	6.0	LOW	L, SL, 3.1 NTU	22:10	9.30	2.0ML:22/3.0ML:49	BKN	129.0	0.25	
16T	KEENEY'S CREEK	07/14/92	10:55	20.0	1066	29.0	6.8	NORM	N, M, 5.5 NTU	22:55	8.10	2.0ML:16/3.0ML:32	CLR	182.0	0.00	
16T	KEENEY'S CREEK	07/28/92	9:22	17.0	1350	20.0	6.4	HIGH	H, SW, 13. NTU	22:40	9.40	1.0ML:16/2.0ML:27	BKN	110.0	2.36	
16T	KEENEY'S CREEK	08/10/92	10:25	17.0	2600	25.0	7.8	LOW	L, M, CLR, 3.5 NTU	23:15	8.80	2.0ML:52/4.0ML:92	CLR, H	160.0	0.33	
16T	KEENEY'S CREEK	08/27/92	1:30	20.3	400	29.0	7.8	LOW	L, SL, CLR, 2.3 NTU	23:15	8.00	15ML:TNTC/20ML:TNTC	CLR	170.0	0.20	FECAL COUNTS ¢400/100ML
16T	KEENEY'S CREEK	09/08/92	12:00	18.0	3000	26.0	7.4	NORM	N, M, MI, 7.3 NTU	23:05	8.90	1.0ML:30/3.0ML:106	CLR	142.0	0.17	
16T	KEENEY'S CREEK	09/22/92	9:20	20.5	1633	22.0	7.6	LOW	L, SL, CLR, 1.7 NTU	23:00	8.10	1.0ML:21/3.0ML:35	OVC	170.0	0.04	
17M	NEW RIVER @ FAYETTE STATION	04/27/92	12:45	12.0	280	10.0	6.9	6.69	H, M, 18. NTU	24:20	10.20	50ML:140/100ML:TNTC	OVC, L	90.0	0.11	EST. FEACL VALUE=280/100ML
17M	NEW RIVER @ FAYETTE STATION	05/12/92	1:40	17.0	25	25.0	7.3	6.61	H, M, 7.3 NTU	22:30	9.70	20ML:5/40ML:10	BKN	100.0	0.00	EST. FECAL VALUE=25/100ML
17M	NEW RIVER @ FAYETTE STATION	06/02/92	11:42	15.0	105	23.0	7.3	7.51	H, M, 13. NTU	23:00	10.00	20ML:14/40ML:42	SCT	100.0	0.04	EST. FECAL VALUE=105/100ML; SAMPLE BOTTLE NOT TREATED WITH SODIUM
17M	NEW RIVER @ FAYETTE STATION	06/16/92	12:14	20.0	121	26.0	7.3	6.94	N, SW, 19. NTU	23:30	9.20	20ML:24/40ML:49	SCT	118.0	0.11	
17M	NEW RIVER @ FAYETTE STATION	06/30/92	11:20	24.0	90	28.0	8.0	-1.42	L, SL, 5.3 NTU	22:10	7.80	30ML:17/40ML:36	BKN	148.0	0.25	
17M	NEW RIVER @ FAYETTE STATION	07/14/92	12:23	28.0	6	31.0	8.6	-0.53	L, SL, 3.1 NTU	22:55	9.20	50ML:2/100ML:6	SCT	170.0	0.00	EST. FECAL VALUE=6.0/100ML
17M	NEW RIVER @ FAYETTE STATION	07/28/92	10:25	26.0	77	24.0	8.1	2.60	N, SL, 9.6 NTU	22:40	6.60	150ML:116/200ML:110	SCT	170.0	2.36	1/2 OF THE CULTURE @ 200ML DILUTON WAS TAKEN OVER BY A YELLOW GRO
17M	NEW RIVER @ FAYETTE STATION	08/10/92	11:45	26.0	12	28.0	8.1	0.64	L, M, CLR, 3.2 NTU	23:15	7.90	150ML:10/200ML:23	SCT, H	180.0	0.33	

SITE NO	SITE NAME	DATE	TIME	WaterTEMP	FC/100ml	AIRTEMP	pH	STRMLVL	H2OCONDITION/NTU	INCUB	DO	DILUTIONS	WEATHER	CONDUCT	PRECIP	COMMENTS
17M	NEW RIVER @ FAYETTE STATION	08/27/92	2:35	26.9	3	29.0	7.0	-0.52	L, SL, CLR, 4.4 NTU	23:15	7.60	100ML:1/150ML:5	CLR	185.0	0.20	EST. FECAL VALUE=3.3/100ML
17M	NEW RIVER @ FAYETTE STATION	09/08/92	1:30	25.0	44	29.0	8.1	0.60	N, M, MI, 4.8 NTU	23:05	8.10	100ML:44/125ML:61	CLR	160.0	0.17	
17M	NEW RIVER @ FAYETTE STATION	09/22/92	10:10	22.5	6	22.0	7.4	LOW	L, SL, MI, 2.3 NTU	23:00	8.30	100ML:4/125ML:7	OVC	150.0	0.04	EST. FECAL VALUE=5.6/100ML; GAGE IS BROKEN.
18T	WOLF CREEK	04/27/92	12:30	10.0	60	11.0	6.6	1.95	H, SW, 3.5 NTU	24:20	10.80	100ML:TNTC/150ML:TNTC	OVC, R	165.0	0.11	FECAL COUNT ¢60/100ML.
18T	WOLF CREEK	05/12/92	1:25	14.0	240	26.0	7.2	2.01	H, SW, 2.7 NTU	22:30	10.10	25ML:TNTC/50ML:TNTC	BKN	170.0	0.00	FECAL VALUE ¢240/100ML; 50ML DILUTION HAD TRANSLUCENT BACTERIAL
18T	WOLF CREEK	06/02/92	11:33	13.0	245	22.0	7.5	1.85	N, SW, 3.8 NTU	23:00	10.80	10ML:27/20ML:44	SCT	220.0	0.04	EST.FECAL VALUE=245/100ML; SAMPLE BOTTLE NOT TREATED WITH SODIUM
18T	WOLF CREEK	06/16/92	11:49	17.0	390	27.0	7.0	2.00	N, SW, 8.9 NTU	23:30	10.30	10ML:39/25ML:71	SCT	250.0	0.11	
18T	WOLF CREEK	06/30/92	11:08	17.0	1200	26.0	7.4	NORM	N, M, 25. NTU	22:10	9.30	5.0ML:TNTC/15ML:TNTC	BKN	322.0	0.25	
18T	WOLF CREEK	07/14/92	12:08	19.0	78	29.0	8.1	NORM	N, M, 4.6 NTU	22:55	9.30	8.0ML:9/18ML:14	SCT	510.0	0.00	EST. FECAL VALUE=78/100ML
18T	WOLF CREEK	07/28/92	10:14	18.0	750	22.0	7.9	NORM	N, M, 10.5 NTU	22:40	9.50	8.0ML:TNTC/18ML:TNTC	BKN	400.0	2.36	FECAL COUNTS ¢750/100ML; STAGE IS BROKEN.
18T	WOLF CREEK	08/10/92	11:35	18.0	40	28.0	8.5	LOW	L, M, MI, 6. NTU	23:15	9.80	5.0ML:2/10ML:1	SCT, H	550.0	0.33	EST. FECAL VALUE=40/100ML
18T	WOLF CREEK	08/27/92	2:30	20.9	100	29.0	7.4	LOW	L, SL, CLR, 3.6 NTU	23:15	8.10	25ML:8/50ML:13	CLR	500.0	0.20	EST. FECAL VALUE=100/100ML
18T	WOLF CREEK	09/08/92	1:15	18.0	171	27.5	8.4	1.70	N, SW, MI, 6.8 NTU	23:05	9.00	35ML:TNTC/50ML:TNTC	CLR	330.0	0.17	FECAL COUNTS ¢171.4/100ML
18T	WOLF CREEK	09/22/92	10:00	20.0	160	22.0	8.0	LOW	L, SL, MI, 3.1 NTU	23:00	8.20	10ML:16/15ML:16	OVC	410.0	0.04	EST. FECAL VALUE=160/100ML
19T	MARR BRANCH	04/27/92	11:48	10.0	60	10.0	6.2	1.21	H, SW, 5.8 NTU	24:20	10.10	10ML:8/25ML:15	OVC	90.0	0.11	EST. FECAL VALUE=60/100ML.
19T	MARR BRANCH	05/12/92	12:50	14.0	240	26.0	6.8	1.18	N, SW, 6. NTU	22:30	9.60	25ML:TNTC/50ML:TNTC	BKN	105.0	0.00	FECAL COUNT ¢240/100ML; @50ML DILUTION, FECAL GROWTH IN OUTER RIN
19T	MARR BRANCH	06/02/92	11:03	12.5	100	24.0	6.4	1.19	H, M, 7.2 NTU	23:00	9.10	10ML:4/20ML:20	BKN	100.0	0.04	EST. FECAL VALUE=100/100ML; SAMPLE BOTTLE NOT TREATED WITH SODIUM
19T	MARR BRANCH	06/16/92	11:17	17.0	600	23.0	6.3	0.83	N, M, 5.4 NTU	23:30	5.20	10ML:TNTC/25ML:TNTC	SCT	172.0	0.11	FECAL COUNT ¢600/100ML.
19T	MARR BRANCH	06/30/92	10:37	17.5	3200	24.0	6.3	0.89	N, SL, 23. NTU	22:10	6.40	1.0ML:32/5.0ML:129	BKN	190.0	0.25	
19T	MARR BRANCH	07/14/92	11:40	20.0	15400	27.0	7.0	0.59	L, M, 12. NTU	22:55	2.10	1.0ML:154/3.0ML:TNTC	SCT	460.0	0.00	WATER AT SAMPLE SITE GREY/MILKY; NOTICIBLE SMELL.
19T	MARR BRANCH	07/28/92	9:55	21.0	3000	20.0	6.9	0.89	N, M, 11. NTU	22:40	4.90	0.2ML:8/0.5ML:15	BKN	245.0	2.36	EST. FECAL VALUE=3000/100ML
19T	MARR BRANCH	08/10/92	11:05	20.2	9400	24.0	7.5	0.70	L, SL, MR, 35. NTU	23:15	4.50	0.2ML:19/0.5ML:47	BKN, H	260.0	0.33	
19T	MARR BRANCH	08/27/92	2:55	22.0	200	29.0	7.4	NORM	N, M, MI, 5.2 NTU	23:15	4.30	0.5ML:0/1.0ML:2	CLR	510.0	0.20	EST. FECAL VALUE=200/100ML
19T	MARR BRANCH	09/08/92	12:45	19.5	1867	29.0	7.4	0.78	L, M, MI, 5.7 NTU	23:05	4.20	3.0ML:56/10ML:130	CLR	325.0	0.17	
19T	MARR BRANCH	09/22/92	9:45	20.0	2000	21.0	7.3	0.69	L, SL, MI, 7.3 NTU	23:00	2.40	3.0ML:TNTC/10ML:TNTC	OVC	500.0	0.04	REPORTED AS GREATER THAN 2000/100ML

APPENDIX 6 . RAW DATA FOR 1992 METALS SAMPLING STUDY

SITE_NO	SITE_NAME	DATE	TIME	WATER_TEMP	AIR_TEMP	PH	STREAM_LVL	NTU_H2OCND_	DISS_OXYGN	WEATHER	CNDUCTIVTY	PRECIP_48H	ALKALINITY	ALUMINUM	MANGANESE	TOTAL_IRON	T_S_SOLIDS	HOT_A
01M	BLUESTONE S.P.	05/28/92	09:22	13.0	13.0	6.5	03.55	3.7/N,SW	10.20	OVC	165.0	000.04	6.20	0.005	0.048	0.075	999.99	999
02T	LITTLE BLUESTONE RIVER	05/28/92	11:03	11.0	17.0	6.5	NORM	3.6/N,M	10.70	OVC	50.0	000.04	21.60	0.002	0.017	0.079	999.99	999
03M	CONFLUENCE (BLUESTONE R.)	05/28/92	11:30	14.0	18.0	7.6	NORM	3.4/N,SL	9.60	OVC,R	179.0	0000.4	59.60	0.009	0.033	0.112	999.99	999
05T	MOUNTAIN CREEK	05/28/92	12:30	10.0	17.0	6.3	NORM	2.9/N,SW	10.80	OVC,R	71.0	000.04	19.60	0.002	0.007	0.045	999.99	999
04M	PIPESTEM S.P.	05/28/92	12:47	13.0	13.0	7.4	NORM	3.5/N,M	10.90	OVC,R	180.0	000.04	66.80	0.005	0.028	0.079	999.99	999
01M	NEW RIVER AT HINTON V.C.	07/22/92	01:47	29.0	30.0	7.8	002.3	4.2/N,CLR,M	7.10	SCT	170.0	TRACE	66.00	0.004	0.127	0.541	999.99	999
02T	MADAM CREEK	07/22/92	01:19	26.0	32.0	8.3	NORM	3.2/CLR,N,SL	7.90	SCT	202.0	TRACE	93.60	0.010	0.040	0.413	999.99	999
03M	NEW RIVER AT HINTON OLD STP	07/22/92	11:39	27.0	27.0	8.1	002.3	4.1/CLR,N,M,	7.50	SCT	171.0	TRACE	71.60	0.007	0.056	0.913	999.99	999
04M	NEW RIVER SANDSTONE FALLS	07/22/92	12:32	29.0	32.0	8.4	NORM	4.0/CLR,N,SL	8.50	SCT	168.0	TRACE	50.00	0.008	0.055	1.025	999.99	999
05T	LICK CREEK	07/22/92	01:02	22.0	28.0	8.3	01.48	2.1/CLR	8.50	SCT	281.0	TRACE	113.20	0.004	0.043	0.625	999.99	999
06T	MEADOW CREEK	07/24/92	10:31	21.0	24.0	8.3	01.10	2.3/CLR	8.70	SCT	178.0	000.02	52.80	0.002	0.480	0.400	999.99	999
07T	LAUREL CREEK AT QUINNAMONT	07/24/92	10:05	20.0	22.0	8.0	05.86	1.1/CLR,N,SL	7.00	OVC,R	160.0	000.02	51.20	0.017	0.021	0.388	999.99	999
08M	NEW RIVER AT PRINCE BRIDGE	07/24/92	09:45	26.0	22.0	7.8	NORM	4.80/CLR,N,M	5.60	OVC,R	162.0	000.02	60.80	0.009	0.065	0.675	999.99	999
09T	PINEY CREEK AT McCREERY	07/24/92	09:28	21.0	22.0	7.9	08.44	1.7/CLR,N,M	7.80	OVC	335.0	000.02	37.20	0.012	0.035	0.450	999.99	999
11T	DUNLOUP CREEK	07/30/92	12:49	19.0	24.0	8.5	04.49	8.1/N,M	8.80	BKN	470.0	000.00	128.40	0.033	0.064	0.900	999.99	999
12M	NEW RIVER AT THURMOND	07/30/92	02:10	26.0	27.0	8.2	05.19	5.9/N,SL	7.10	SCT	165.0	000.00	60.00	0.008	0.055	0.812	999.99	999
13T	ARBUCKLE CREEK	07/30/92	01:25	19.0	23.0	8.4	01.16	5.2/N,SW	8.70	SCT	420.0	000.00	140.00	0.029	0.054	1.162	999.99	999
14M	NEW RIVER AT CUNARD	07/30/92	11:17	26.0	27.0	8.0	05.45	4.6/N,SL	6.80	CLR	166.0	000.00	59.00	0.006	0.056	0.750	999.99	999
15T	COAL RUN	07/30/92	10:54	18.0	21.0	8.1	LOW	8.9/L,M	9.20	SCT	400.0	000.00	123.00	0.000	0.051	0.975	999.99	999
16T	KEENEY CREEK	07/28/92	09:22	17.0	20.0	6.4	HIGH	13.0/H,MR,SW	9.40	BKN	110.0	000.36	21.40	0.040	0.071	0.938	999.99	999
17M	NEW RIVER AT FAYETTE STATION	07/28/92	10:25	26.0	24.0	8.1	05.45	9.60/N,SL	6.60	SCT	170.0	000.36	28.40	0.015	0.029	1.112	999.99	999
18T	WOLF CREEK	07/28/92	10:14	18.0	22.0	7.9	NORM	10.5/N,MR,M	9.50	BKN	400.0	000.36	122.40	0.020	0.111	0.750	999.99	999
19T	MARR BRANCH	07/28/92	09:55	21.0	20.0	6.9	00.89	11.0/N,MR,M	4.90	BKN	245.0	000.36	7.80	0.011	0.264	1.175	999.99	999
01M	SUMMERVILLES DAM TAIL H2O	05/26/92	09:21	10.0	14.0	99.9	08.72	3.5/CLR,N,SW	11.40	OVC,R	45.0	000.11	16.00	0.018	0.049	0.080	999.99	999
02M	MID GAULEY AT MARR CAMP SITO	05/26/92	10:32	12.0	15.0	99.9	LOW	2.8/CLR,L,M	8.10	OVC,R	53.0	000.11	12.80	0.022	0.035	0.070	999.99	999
03T	PETERS CREEK	05/26/92	10:57	13.0	19.0	99.9	NORM	3.6/MI,N,M	10.40	OVC	225.0	000.11	48.80	0.017	0.128	0.090	999.99	999
04M	SOUTH SIDE SWISS (UPPER)	05/26/92	11:51	13.0	22.0	99.9	NORM	2.8/N,SL	5.20	BKN	60.0	000.11	16.60	0.011	0.030	0.060	999.99	999
R-I	WHITEOAK CR. RT-16 & RT-25	07/29/92	09:00	13.0	999.9	7.1	99999	2.3/	0.60	CLR	600.0	999999	98.98	0.011	0.296	1.962	999.99	999
R-I	DUN GLEN HOUSE DRINKING H2O	07/31/92	10.16	99.9	999.9	99.9	99999	999999999	99.99	99999	9999.9	999999	98.98	0.000	0.002	0.575	999.99	999

99.999 = No data